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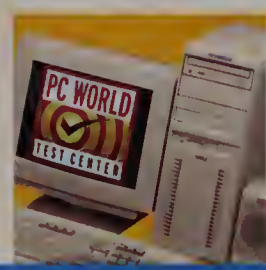
Top 10 Personal Printers
Price Cuts Mean Great Deals



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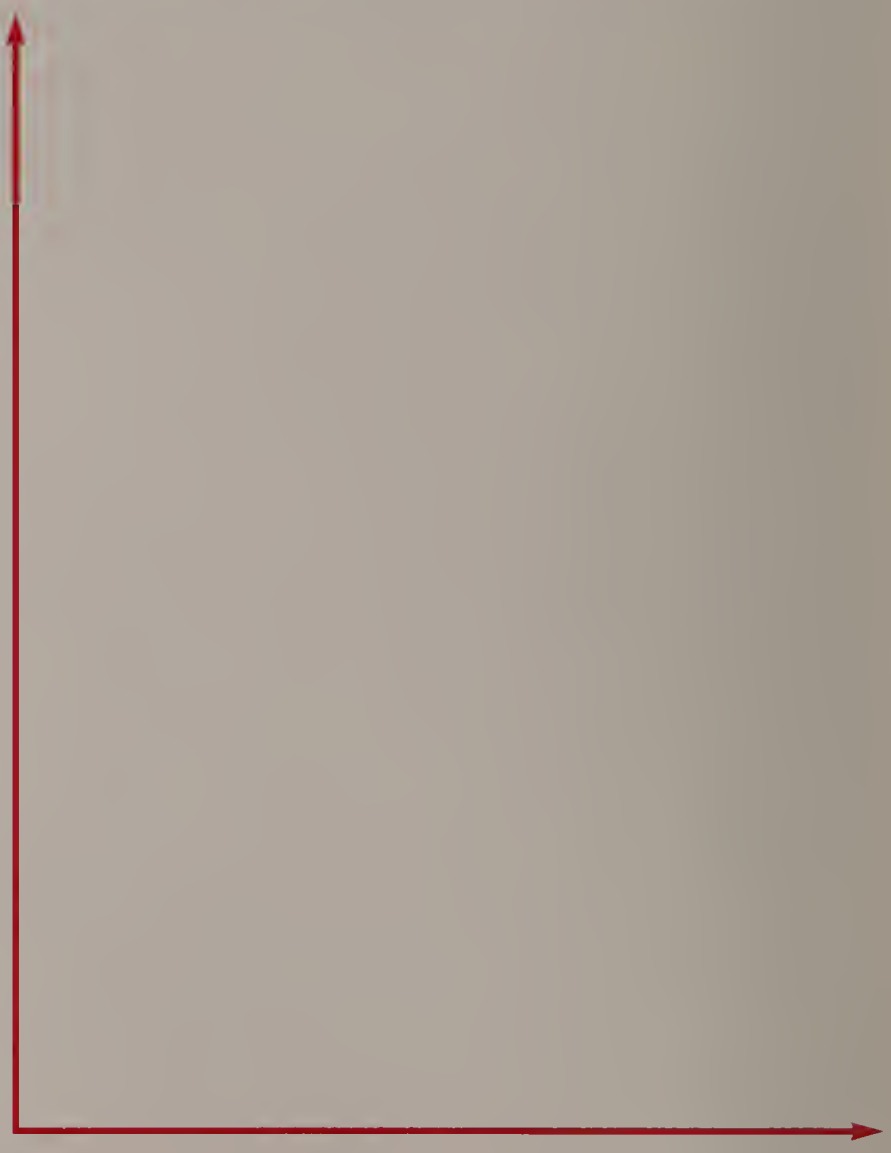
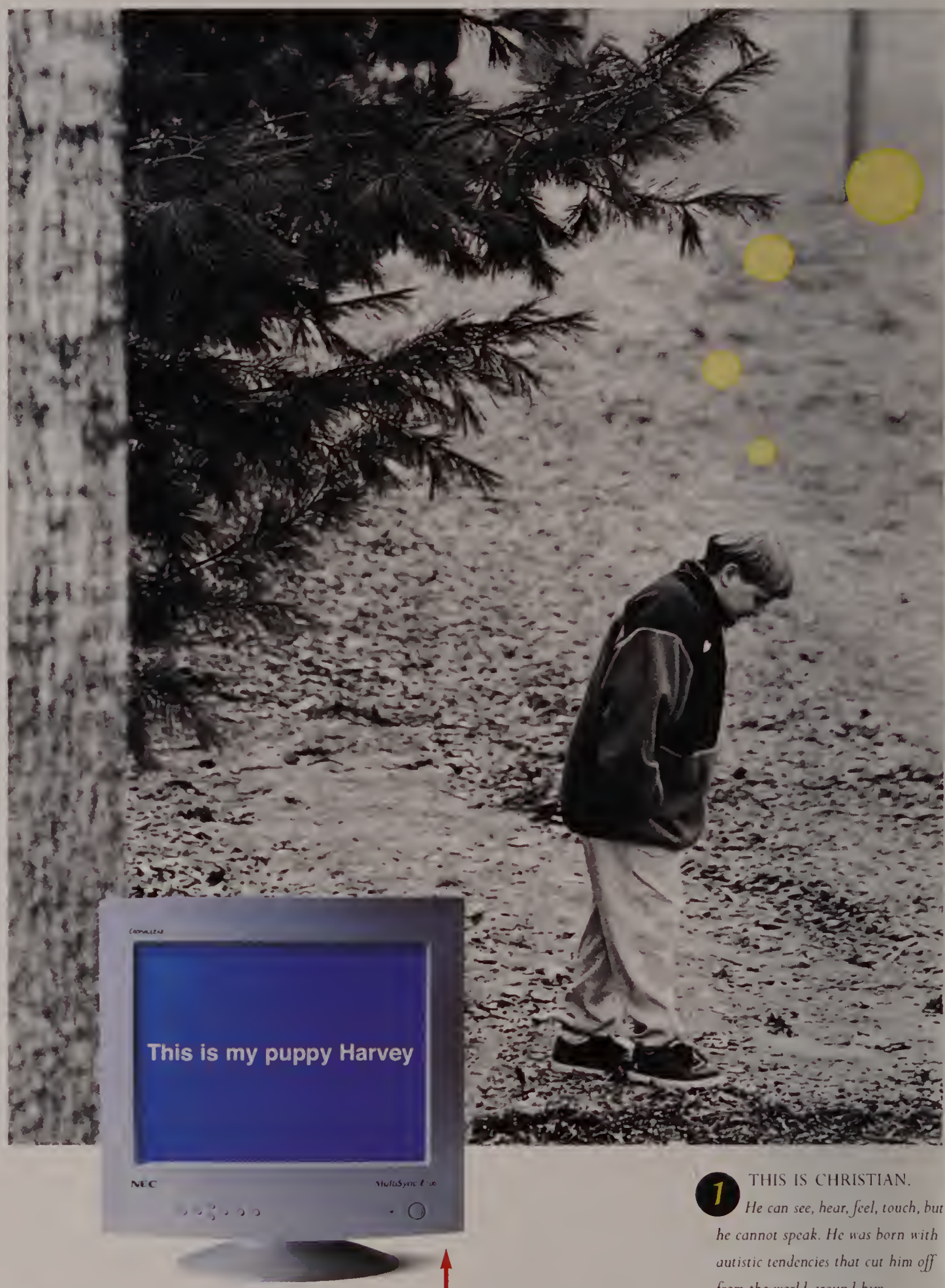
Christian Murphy was non-verbal.
He lived with a wall between himself and the world.





1 THIS IS CHRISTIAN.

He can see, hear, feel, touch, but he cannot speak. He was born with autistic tendencies that cut him off from the world around him.

Until he found this window.

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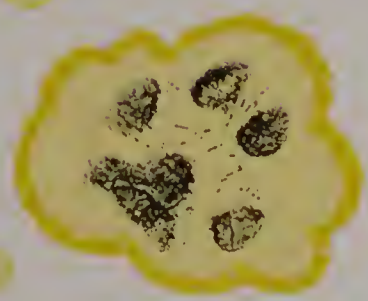

2 A TEACHER DISCOVERED *that Christian would respond to images from his life. She put visual cues to the story of his new puppy on a special keyboard.*

3 THE MONITOR BECAME HIS VOICE. *With it he makes class reports and conversation. With it, Christian, 11, has been in the regular Osterville, MA public school since first grade.*

4 WITH THE PICTURES, HE MADE SENTENCES. *With the sentences, he made friends. Christian's monitor is the window between his non-verbal world and the speaking world of his friends. Through it, he teaches them many things.*

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E500	1280 x 1024 @ 65Hz	119MHz	CROMACLEAR	0.25mm mask
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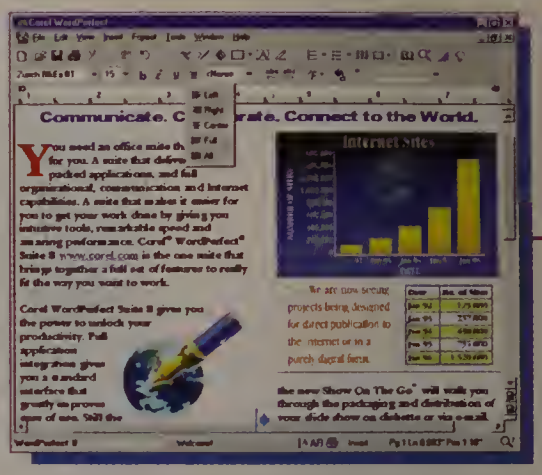

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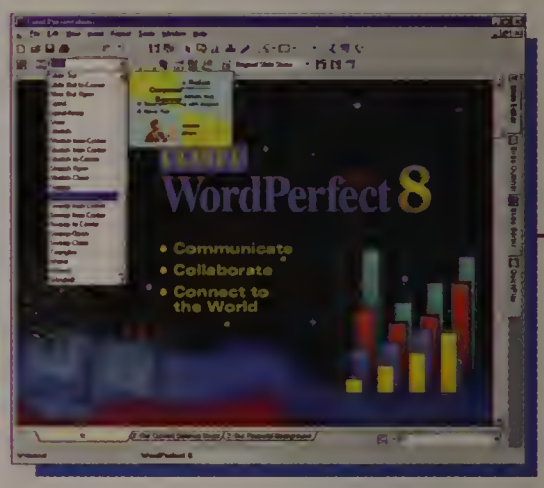

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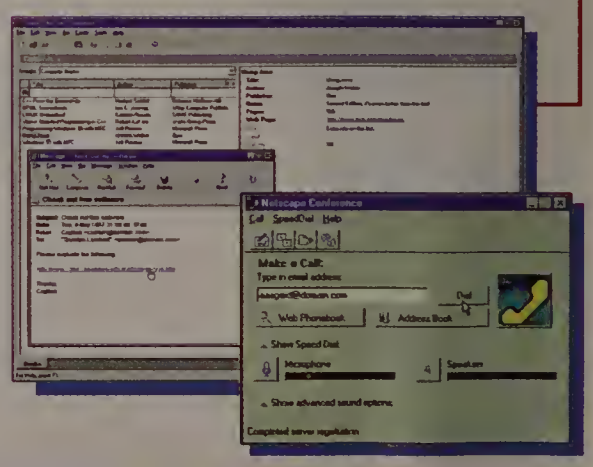

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AUGUST

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SPECIAL ISSUE

118 ONE-STOP GUIDE TO TODAY'S INTERNET

Face it. The Internet is changing how we work and live. But the novelty's gone, and frustration has set in: Browsers change every six months or so, access sometimes slows to a crawl, e-mail files get garbled or lost, and Web sites multiply faster than the Pentium II. In this special issue, *PC World* offers solutions to the problems that beset today's Internet. We hope it helps.

120 BROWSER SECRETS

HOW-TO They're not just browsers anymore. As new versions of Navigator and Internet Explorer evolve into do-it-all Net suites, these tips will help you do it all better—getting to Web sites and newsgroups easily, downloading files faster, sending e-mail that's readable by everyone, and much more.

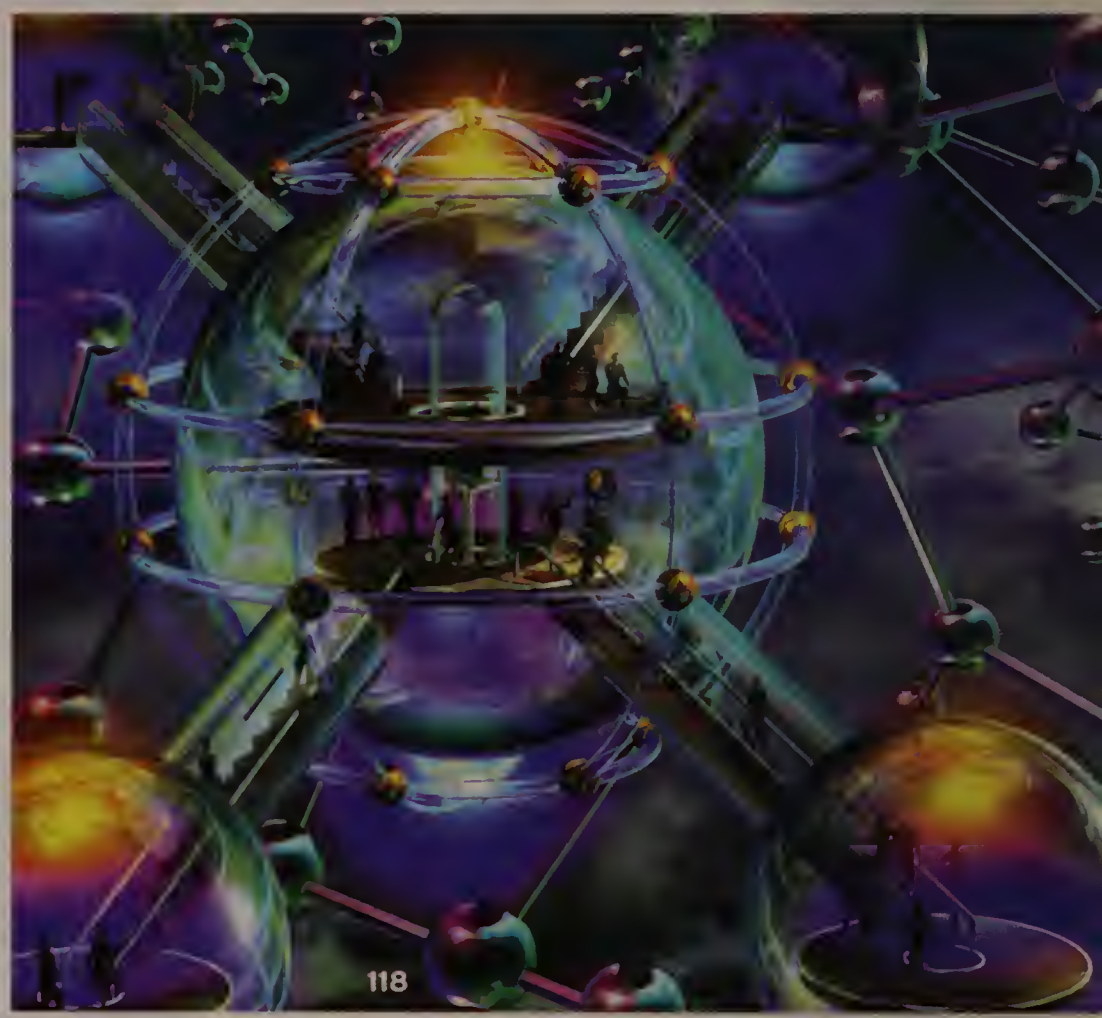
145 WEB OF DECEIT

CONSUMER ISSUES

online It's turned into the wild, wild Web. As online businesses stake claims on the electronic frontier, consumers are being hoodwinked by marketing sites that pose as sources of unbiased information while collecting all sorts of personal data on the sly. Here's how to spot the phonies and dodge the hype.

158 BANDWIDTH ON DEMAND

REVIEW online Frustrated by ever-slower access to the Web but confused by all the new ways of speeding it up? We examined five technologies—56-kbps modems, ISDN, ADSL, cable modems, and satellite hookups—to find the best high-bandwidth option for your small-business needs and budget.



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online Additional material available on PC World Online: www.pcworld.com

169 FIRST-CLASS E-MAIL

REVIEW online We're all being flooded by e-mail that runs the gamut from business correspondence and unsolicited advertising to notes from mom. The right software can help—and could be as close as your new browser suite. We tested six low-cost and no-cost Internet mail clients and recommend two that deliver the goods.

190 BEST OF THE NET

REVIEW online What's the best place to find tech support at 2 a.m.? Get the lowdown on business competitors? Find hot stock tips? Troll for real estate bargains? *PC World* picks the best Web sites, newsgroups, and chat rooms, with pointers on finding everything from autos to zip codes.

COVER *Illustration by Jim Ludtke*

ICONS: JEFFREY PELO

TOP OF THE NEWS

50 CYRIX POWERS $2100 PENTIUM II-CLASS PCS
New PCs sporting Cyrix's fast 6x86MX chip will offer premium performance for hundreds of dollars less than comparable Pentium MMX-233, Pentium II, or AMD K6–based systems. Plus, we test a Pentium II-300 that breaks all WorldBench records.

54 SPAM ATTACK: GET READY
Online services, ISPs, consumers, and politicians are waging war against bulk e-mailers. Here's how to fight spammers yourself.

56 BIG-SCREEN NOTEBOOKS: ULTIMATE TRAVELING COMPANIONS?
Notebooks with sharp 13.3-inch displays are perfect for working with presentations and spreadsheets. The downside? They're slower, more expensive, and heavy.

62 NT MOVES TO CAPTURE PUBLISHING
More major applications help Windows NT 4.0 gain ground in publishing and multimedia. But a lack of utilities and hardware support keeps it lagging behind the Mac OS.

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100 Hitachi MPEG1A videocam
100 Kodak DVC 300 Digital Video Camera
102 Compro, Panasonic, Plextor, Toshiba CD-ROM drives
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108 Before & After, PhotoMate photo-editing software
111 Simply Accounting 5.0
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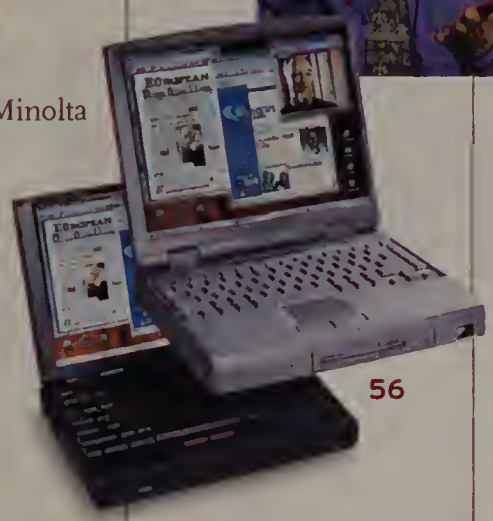
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TOP 100

207 CHIP WARS, CHEAPER PCS
online It's not just Intel inside anymore. Five PCs using chips from AMD and Cyrix place in this month's Top 20 charts, as well as the first system featuring a 233-MHz Pentium II. The result: power PCs for peanuts, as vendors try to move older inventory.

210 POWER DESKTOPS
TOP 20 Systems sporting brand-new Pentium II and AMD K6 processors go head-to-head on our Power chart. Gateway 2000's G6-233 earns a Best Buy.

222 BUDGET DESKTOPS
TOP 20 Our Budget chart features some of the last non-MMX Pentiums. As vendors slash prices on older Pentium PCs, look for bargains like IBM's PC 350 P-166, a $1715 Best Buy this month.

230 NOTEBOOKS
TOP 20 Seven newcomers shake up the Top 20 Notebooks chart, including Toshiba's deluxe Tecra 740CDT.

RELIABILITY & SERVICE MONITOR

238 WIN A GATEWAY 2000 PC
How satisfied are you with your computer? Fax in this survey for a chance to win a Gateway 2000 G5-166 M, a Top 20 PC.

241 PERSONAL PRINTERS
TOP 10 Summer-sale cuts of up to $100 and the debut of two new HP printers heat up this month's chart.

245 17-INCH MONITORS
TOP 10 Dell and Nokia repeat as chart-toppers, but look for discounts from Panasonic, CLR, and Mitsubishi.

249 GRAPHICS BOARDS
TOP 10 The new Matrox Mystique 220 comes with business and home software bundles. The Business version ranks number three on this month's chart.

251 EXTERNAL AND PC CARD MODEMS
TOP 10 Practical Peripherals' Pro Class 336V.34 Data/Fax Modem has a dirt-cheap $159 price and good performance.

HERE'S HOW

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Troubleshoot Windows 95's fatal errors, move the swap file to create more room, convert Word 97 files to earlier versions.

270 **WINDOWS TIPS**
Move files to floppies faster, pare down win.ini in Windows 3.x, use sound effects in Win 95.

276 **SPREADSHEETS**
Copy formulas correctly, flip your spreadsheet in 1-2-3.

278 **WORD PROCESSING**
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285 **DATABASE TIPS**
Fax reports to multiple recipients with Access 97.

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292 **HARDWARE TIPS**
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Choose the right PC speakers for great audio.

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@HOME

253 **@HOME PRODUCTS**
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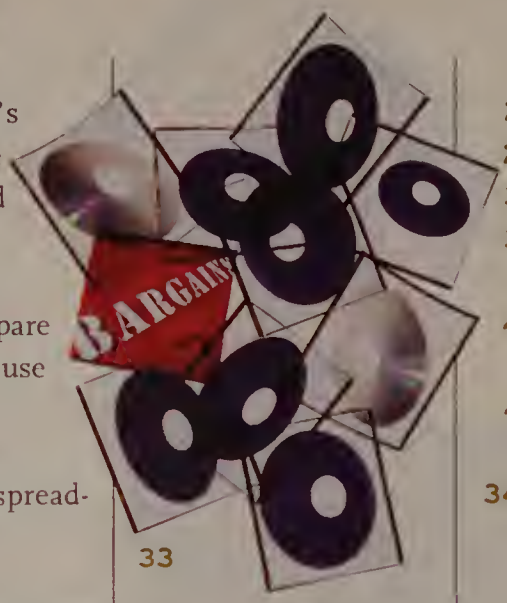
254 **KEEPING UP**
Web sites and services for consumers.

258 **TOP 5 HOME PCS**
Micron's new $2269 Home MPC comes with MMX power at a price that won't bankrupt your household.

260 **HOME OFFICE**
Steve Bass turbocharges his mother's Web tools.



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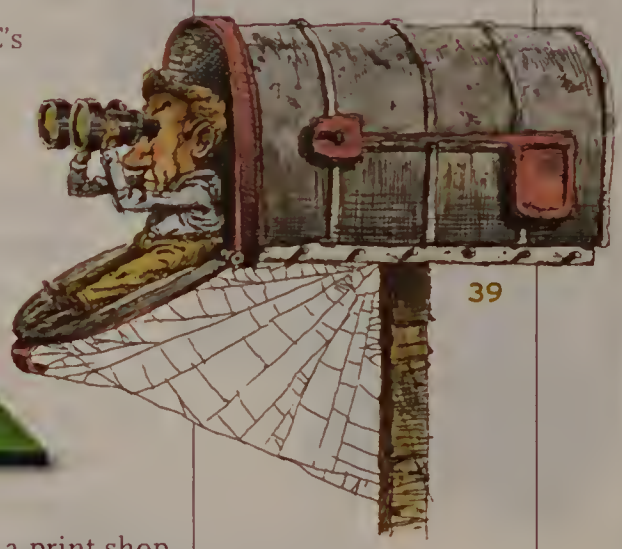
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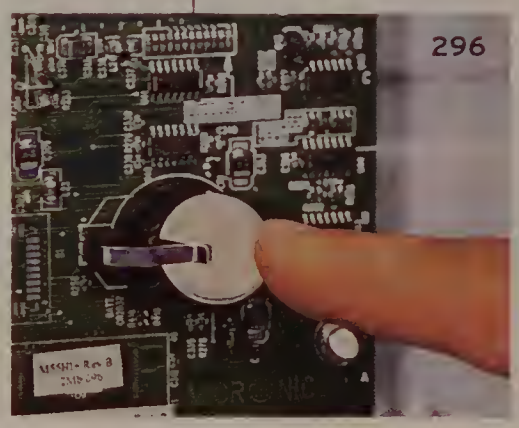
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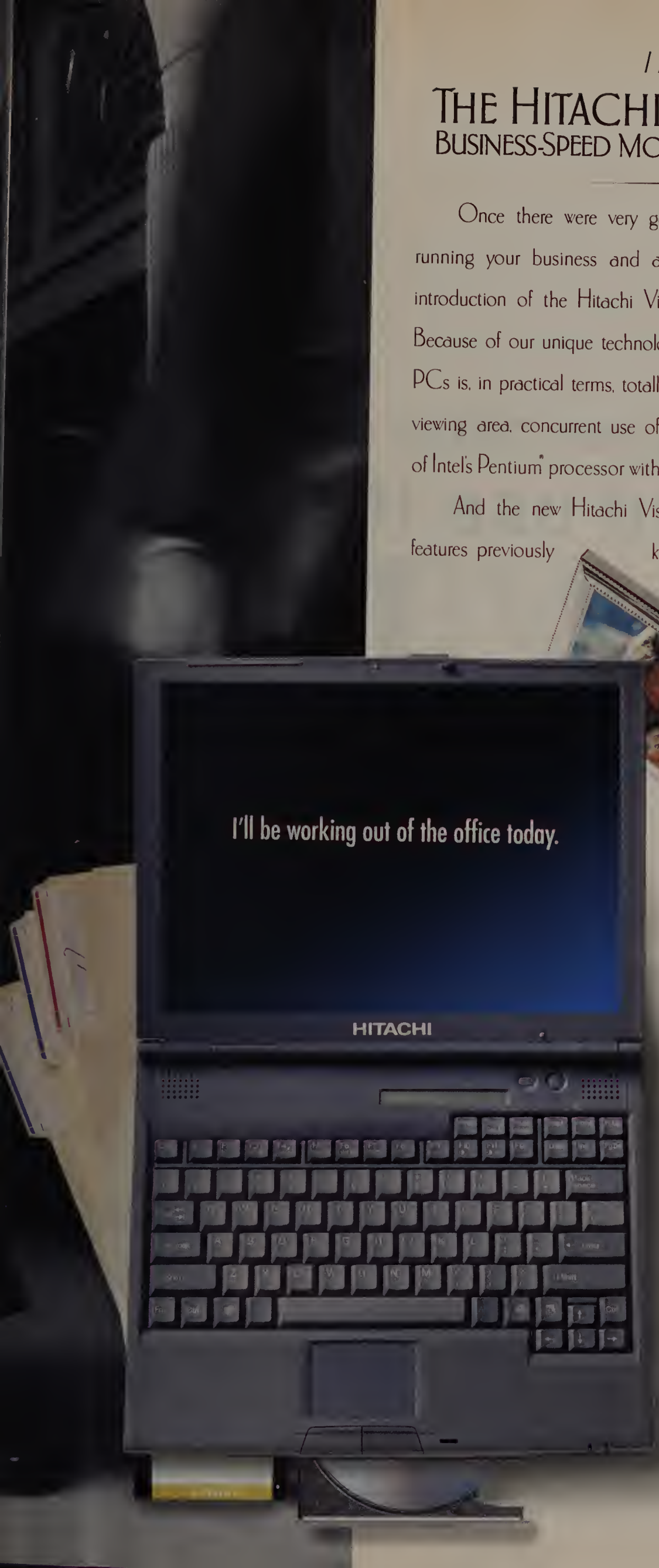

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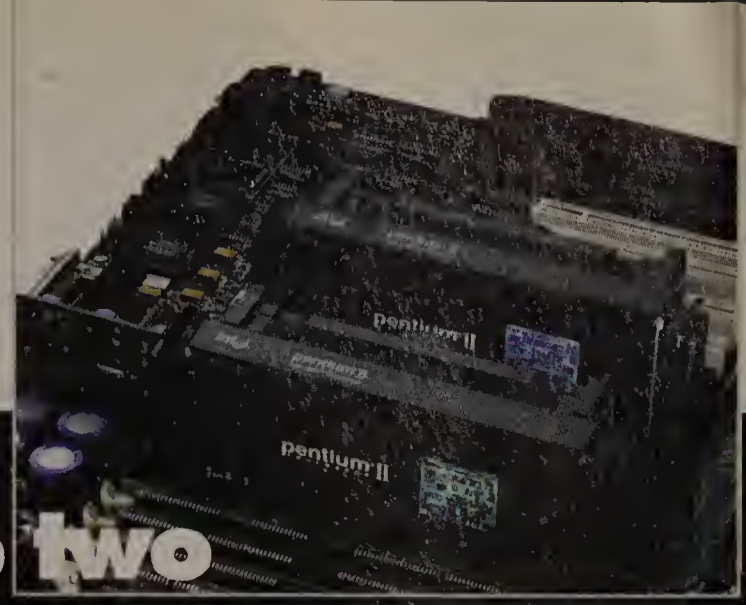

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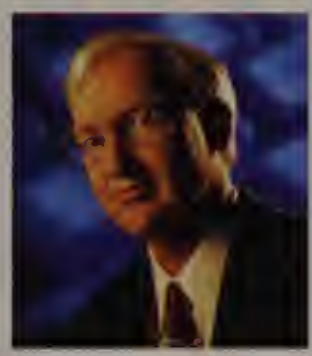
How Dumb Are the Digerati?

OUR CURRENCY SAYS, "In God We Trust." Apart from that, we Americans trust little. We distrust our politicians for many reasons: faithless promises inspired by polls; campaign contribution quids for which we know there must be quos; political action committees whose only action is laundering money; and tax-free think tanks that think impeccable party-line thoughts.

We distrust businesses for many reasons, too. They beg for deregulation to promote competition, then use deregulation as a green light for mergers that eliminate competition. They say nothing is more important than their "human capital" while turning this capital into temps.

But there is one thing we Americans seem to trust even less than politicians or business executives: that bogeyman called the media. Although we value advertisements as a source of information, their puffery makes us wary of their claims. When we subscribe to a new publication and suddenly find our mailboxes stuffed with new junk mail, 98 percent of us gripe about being exploited (even as 2 percent place orders for new products). When favorable product coverage appears next to an ad for the product, we grow suspicious, whether reading a magazine or watching TV. These practices earn the media more blame than trust.



Some **Internet** businesses see the **digerati** as upscale **patsies** and **bozos** with browsers.

THE INTERNET'S CREDIBILITY CHALLENGE

BORN INTO AN INNOCENT noncommercial world, the Internet has now become a public medium and entered the prevalent atmosphere of mistrust. Given the circumstances, you'd think Internet proponents would attach some importance to establishing its credibility. Yet pressure works mostly in the opposite direction. Practices that were considered deceptive in print, such as obscuring or eliminating the distinction between advertising and editorial content, are touted as "added value" online.

Some companies that wouldn't dare sell editorial coverage in their print publications want to do exactly that in the online world by selling placement in product listings that look like editorial content. You may think a Web site is giving you comprehensive product listings or a selection based on merit. If no one tells you otherwise, you'll never be the wiser. Your ignorance is someone's added value.

While most magazines seek to preserve credibility by eliminating placement of ads next to related articles, the Internet maximizes such adjacency. Matching information to your interests really does add value. Synchronizing ads too closely to customized information, however, is as likely to inspire distrust online as in print.

As it happens, Web technology could manage advertising and editorial adjacencies better than print—by letting *you* decide what you want. But Web publishing and marketing currently seem more inclined to eliminate choice and compel you to march to Web sites' commands.

New Internet advertising formats from Netscape and Microsoft show the power of the movement to dictate your Internet experience. You will soon find ads exploding from the text you're trying to read, or popping up in one part of the screen and dancing across the content. You'll even find ads crawling across the text you're reading and refusing to get out of the way until you click on them. You may pride yourself on being one of the *digerati*—the digital elite. But some Internet businesses see the digerati as bozos with browsers, upscale patsies who will tolerate anything as long as it's digital—and in many cases, that assessment may be accurate.

VEXING ISSUES, ENCOURAGING SIGNS

IN "WEB OF DECEIT," Fern Schumer Chapman examines some of the thorny issues that digital media present. There are reassuring signs that some of these issues may be addressed with your protection in mind. For one thing, the Federal Trade Commission—responsible for preventing deceptive advertising—regards deception as deception, regardless of the medium.

In one private initiative announced in June, the American Society of Magazine Editors promulgated a new set of guidelines for Web sites. The opening sentence declares: "The same ASME principles that mandate distinct treatment of editorial content, advertisements, and special advertising sections ('advertorials') in print publications also apply to electronic editorial products bearing the names of print magazines or offering themselves as electronic magazines." We have posted the full text on PC World Online for your examination and comment (www.pcworld.com/aug97/guidelines). We'll pass your observations on to ASME.

Like other media, Web sites are selling advertisers their access to you. If they won't play straight, take your business elsewhere. There is no more effective enforcement mechanism.

Phil Lemmons is editorial director of PC World. ■

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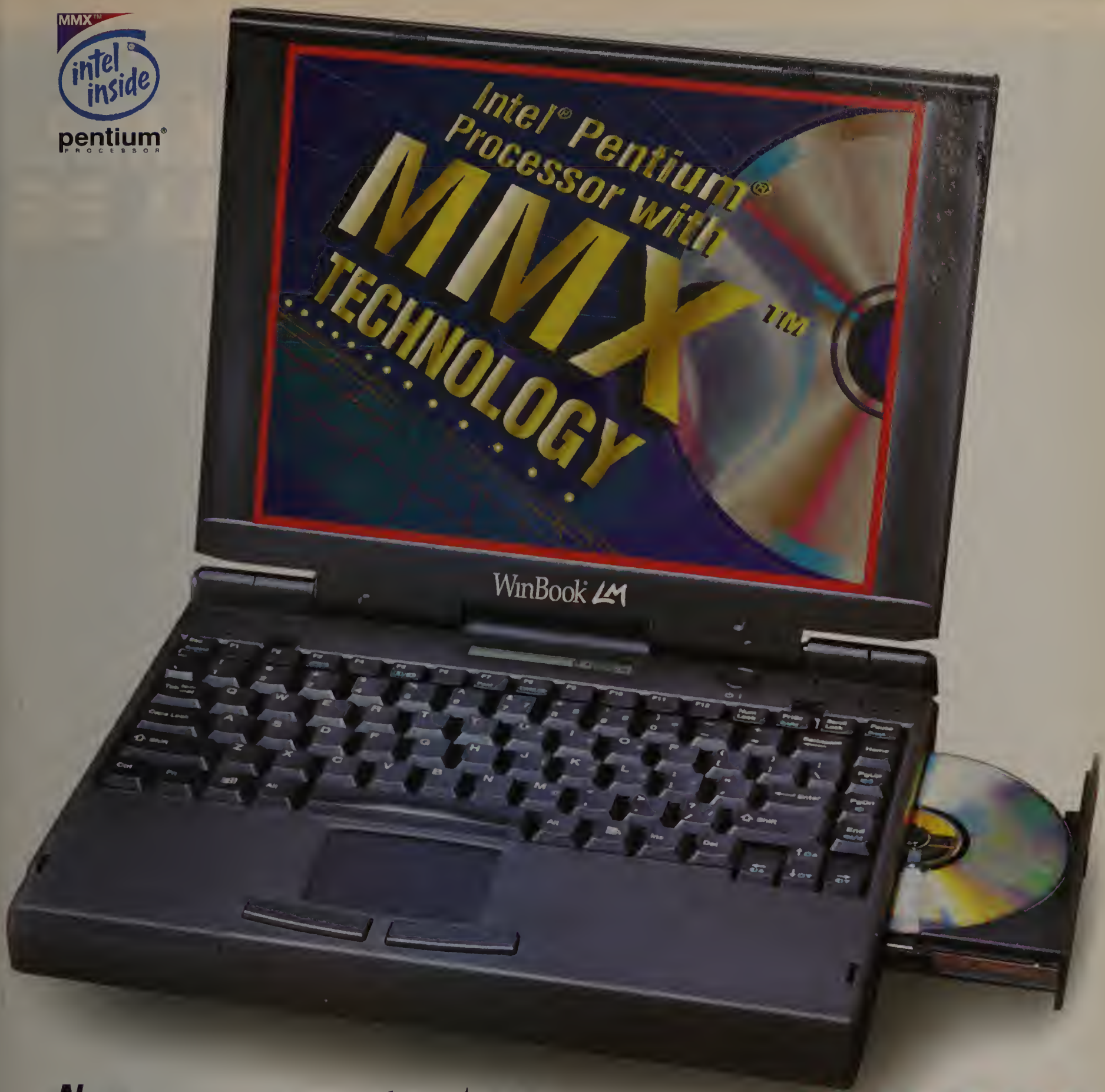

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YOUR TAKE ON: Intel versus AMD ◆ Modem slowdowns ◆ Losing memory

PC RELIABILITY, SERVICE, AND THE ALMIGHTY DOLLAR

IN RESPONSE TO "When Bad PCs Happen to Good People" [June] and specifically to Brij Kathuria of Compaq, I take severe exception to Mr. Kathuria's inappropriate statement "Assemblers always have problems...." After 20-plus years in electronics manufacturing, I can assure Mr. Kathuria that assemblers do *not* always have problems.

If "retraining our manufacturing personnel while still getting new products out the door" is Mr. Kathuria's idea of effective quality management, then I suggest he reevaluate his objectives and responsibilities because he obviously can't get a quality job done that way.

I suspect that Compaq made a corporate decision to rush those new products out the door with regard only to revenue, without consideration for the customer or the company's reputation. Seems that the almighty dollar rules at Compaq, and to hell with the customer.

William Barrett, Internet

WHAT ABOUT THE ALPHA PROCESSOR?

WHY DO ALL OF THESE articles on the Pentium II chip (233-MHz, 266-MHz) ignore an even faster processor—Digital's Alpha chip, which offers blazing speeds up to 500 MHz? Why hasn't *PC World* written anything about Digital's Alpha? I would love to see an article about this superfast processor.

Jeremy Klauburg, Internet

Editor's response: *PC World* covers PC products, rather than workstation-class products that use the Alpha chip. –Charles Piller

PHONE LINES AND SLOW CONNECTIONS

IN THE JUNE ISSUE [*Answer Line*], Scott Spanbauer missed the most obvious reason for modem slowdowns. When I worked as a senior technical support representative for an ISP, I received many calls describing these exact symptoms. While it's true that some phone lines may be bad enough to limit a 28.8-kbps modem to 14.4 kbps, odds are the caller would see slight fluctuations in baud rate for different calls if the phone lines were the problem. The article states, "If every connection you make tops out at 14.4 kbps..." With these numbers the much more likely explanation is that the user upgraded from a 14.4 modem to a 28.8 or faster and didn't change the serial port baud rate setting on their PC. With a 28.8 or faster modem, this baud rate ▶

HOT BUTTON

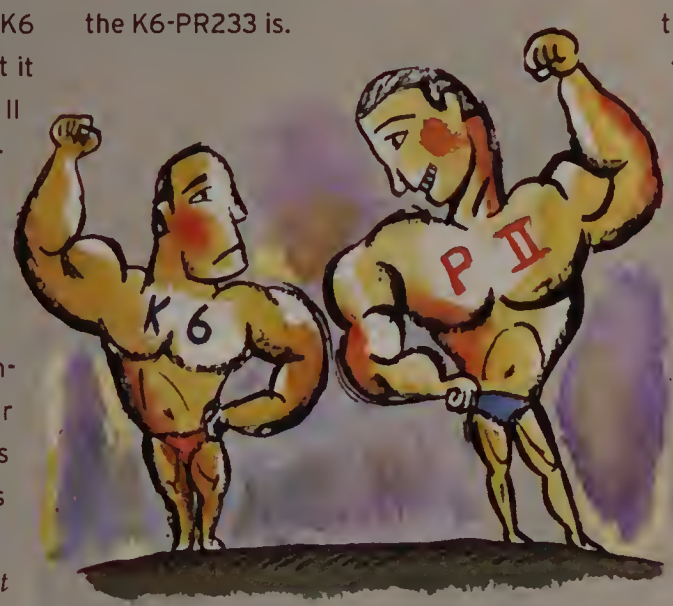
Pentium II-266 Versus K6-233: Apples and Oranges?

IN YOUR RECENT ARTICLE comparing Intel and AMD CPUs ["The New Power Players," *Top of the News*, June], you make AMD's K6 appear like a second-class CPU and treat it unfairly. Intel makes a 233-MHz Pentium II chip. So why did you compare the 233-MHz K6 with a 266-MHz Pentium II?

Meanwhile, the K6 processor has 8.8 million transistors with MMX extensions while Intel's Pentium II chip has only 7.5 million transistors with MMX extensions. Something has got to be said for making a better product at a lower price as AMD has done, as opposed to Intel's strong-arm marketing tactics.

Paul Nixon, Internet

I JUST RECEIVED the June issue and gleefully saw that you covered the AMD K6 versus Intel Pentium II question. However, I do have a couple of concerns about your comparison. Why did you compare AMD's 233-MHz K6 to the 266-MHz Pentium II? Why not compare it to the 233-MHz Pentium II? Also, further into the story, you mentioned that AMD's K6-PR266 processor was forthcoming, but failed to mention that it would be much more competitive with the 266-MHz Pentium II—at a comparable frequency—than the K6-PR233 is.



You also concluded that the Pentium II is the best bet for fending off obsolescence. This seems to me to be entirely dependent on the acceptance of the new SEC architecture (and Accelerated Graphics Port). Furthermore, you failed to mention that AMD will be coming out with new chip sets this year that take advantage of OpenPIC multiprocessing architecture and may improve K6 performance over current chip sets.

The computer industry's history is rife with lessons to be learned from proprietary architectures, and I think it's unfair to assume that it will be different with Intel.

Johnnie Naylor
Scotts Valley, California

Editor's response: As we noted in our coverage, K6-based systems offer excellent price/performance, though they lag behind the Pentium II-266 machines slightly in raw speed. No Pentium II-233 machines were available for review when the June story was prepared, though they were reviewed in the July issue (see *Top of the News*). The number of transistors on a chip may or may not determine its ultimate performance, as our coverage shows. In general, *PC World* hesitates to predict the performance of products we have not evaluated, such as systems based on the yet-to-be-released 266-MHz AMD K6 or alternate chip sets for AMD products. Nearly all major PC vendors have adopted the SEC architecture, and it seems clear that it will thrive in the future, regardless of what happens to the Socket 7 architecture used by AMD and Cyrix. –Charles Piller

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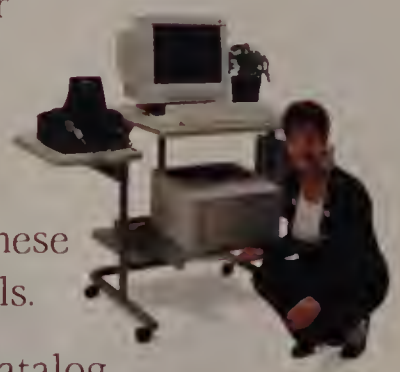

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should be set to at least 57,600 or 115,200. A COM port setting of 14,400 will force your brand-new 28.8, 33.6, or 56 modem to connect at nothing higher than 14,400.

Peter Davies, Vienna, Virginia

Author's response: Look as hard as you like, but you'll never find a 14,400 speed setting for your computer's serial port—the nearest values are 9600 and 19,200, neither of which is likely to yield connect rates of exactly 14,400. You're correct in stating that for 28.8-kbps modems the serial port should be set to 57,600 or higher. Under Windows 95, however, modem installation .inf files generally set the appropriate port speed for you automatically, as do updated modem setup files for Windows 3.*x* and other communications programs. If you install your new modem using the latest drivers provided by the manufacturer, port speed shouldn't be a problem. **—Scott Spanbauer**

PRACTICAL MODEM CHOICE

I FAIL TO SEE why May's Top 10 Modems chooses the Practical Peripherals modem as Best Buy rather than the U.S. Robotics Courier. The Courier all has the same features as the Practical Peripherals except the lifetime warranty. And the Courier has FlashROM, a big advantage where protocols and ITU standards are changing.

Matt Johnson, Reeds, Missouri

Editor's response: The Practical Peripherals PC288LCD V.34 tied with the Motorola ISG Premier 33.6 for fastest modem. Plus it has a helpful LCD that shows users how fast the modem is connecting and transferring data, in easy-to-read text rather than with a blinking light. We found the PC288LCD's performance and LCD to be more valuable than the Courier's features. (Note: At press time 3Com bought U.S. Robotics.) **—Eric Hellweg**

WASTING MY TIME

STEPHEN MANES'S ARTICLE "Your PC Is Wasting Your Time!" [*Full Disclosure*, June] was a waste of my time. Is it possible that Raj Reddy of Carnegie Mellon University has the time to figure out how many hours are wasted waiting for the computer to boot up? Who cares? Manes goes further, referring to the World Wide Wait: "Once online, the wheel-spinning continues." Sure—at least half the ▶

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COMING UP
IN SEPTEMBER

TIPS FOR MICROSOFT OFFICE 97

We've got the keys to the most widely used office suite in the world: Microsoft Office 97. Check out our tips for turbocharging Word, Excel, and Access, and discover the best ways to use Office's new Web features.

A NEW PC: THE FIRST SIX MONTHS

Just how well does your new PC work? We completed a yearlong project to learn from 25 consumers during their first six months of PC ownership. We chronicle the joys and frustrations of system setup, hardware failures, tech support calls, and much more.

THE BEST 17-INCH MONITORS

We stare at them all day, but finding the right 17-inch monitor is tough when look-alike specs often gloss over big differences in displays. We test 23 popular monitors priced from $599 to $1049 and pick two can't-miss Best Buys.

PUSHING INFORMATION

Internet push applications, or Webcasters, all aim to organize the steady stream of info you need from a variety of sources. But not all deliver the goods. We download 12 leading Webcasters and sort it all out for you.

ALSO NEXT MONTH

▶**PC World Top 100:** Check out the Top 20 power desktops, budget desktops, and notebooks, plus the *PC World* Top 10 workgroup printers, 17-inch monitors, graphics boards, and internal modems.

▶**Top Servers:** Hot-swappable storage and power help a new challenger top a competitive class of inexpensive servers. Plus the latest Web collaboration tools, including Netopia Virtual Office and NetMeeting.

▶**Here's How:** *Upgrade Guide* on installing a video camera on your PC, *Answer Line* on reinstalling Windows 95, *Internet Tips* on buying from Web auction sites.

PC WORLD

time spent on the Net is wasted. But do we really need to know these figures?

Give your opinion on something we care about, like when will cable companies connect us to the Internet with fiber optics? Or when will videoconferencing work at 30 frames per second? At the end of reading my favorite computer magazine, I like a good kicker, not a column that wastes my time.

Duane Krautman, New York

WHERE DID MY MEMORY GO?

THANK YOU, Stephen Manes, for your May column "It's Party Time on Your Hard Disk." I was down to 12MB on my measly 500MB hard disk and couldn't figure out where my memory was going. After reading your column, I immediately looked in my cache—and there it was. I deleted all those needless .htm and .gif files (there were so many!), and thanks to you, recovered almost 10 percent of my hard disk—about 60MB.

The information found in your column is well worth my three-year subscription. Keep up the good work.

C. K. Crease, Wichita, Kansas

STRAIGHT TALK ABOUT PC COSTS

THANKS TO Phil Lemmons for standing up and saying the emperor has no clothes [*Up Front*, June]. My boss has now been persuaded not to trash our network of PCs (in favor of an abacus). Whew! Now, as for the coffeepot: A coworker has offered to provide coffee service for only $25,000 a year. Interested? She'll throw in free cinnamon buns on Fridays.

Tom Farmer, Internet

STEVE BASS ON GERALDO

I BACK UP MY COMPUTER regularly, but I'd still watch the show "On the Next Geraldo: Bass Gets Backup Religion" [*Home Office*, June]. "Clutching pocket protectors and waving backup tapes," I'd love to see Bass take on Geraldo.

Keith Ullman, Internet

PC World *welcomes your responses, ideas, and other letters to the editor. See page 14 for contact information.* ■

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The Mac OS Report

Number two in a series—the facts about Mac OS 8

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It will also set an entirely new standard of powerful, intuitive computing—a standard the competition can try to catch up to. (Again.)

A new way of working

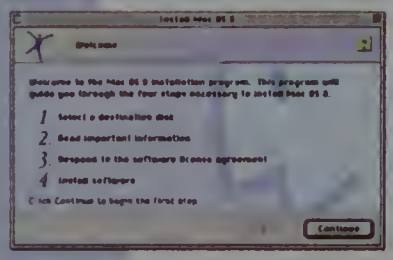
The moment you start using Mac OS 8, you'll feel the difference: you'll find yourself accomplishing more in less time. A multi-threaded Finder™ lets you execute multiple tasks simultaneously, such as launching applications and copying files. Mac OS 8 includes new information-management tools, such as contextual pop-up menus and spring-loaded folders, that give you quicker and easier access to all your information. A scalable environment lets you either limit your menu and window options, or expand them—whichever works better for you. A new, dimensional look makes the interface more dynamic and engaging than ever. And Mac OS 8 also includes the latest versions of QuickTime® with its MPEG support, QuickTime VR and QuickDraw™ 3D.

How easy is it to get going with all these new technologies and features? Very. Because our new installer and setup assistants take you through each step of configuring your new system software. Once you're up and running, PowerPC™-native code improves your performance. Mac OS 8 is also completely compatible with all PowerPC and 68040-based hardware and software.

A new way of accessing the Internet

Mac OS 8 includes TCP/IP and PPP for easy network or modem access direct from the Finder. You get Netscape Navigator™ and the PointCast Network.™ And a new Internet Setup Assistant makes it easier than ever to get on the Net, whether you're doing it from home with a modem or from work with a high-speed connection.

Personal web sharing is standard, so you can turn any Macintosh into an Internet web server. And Java™ support is built in, so you can run Java applications just as though they were any other desktop applications. (If you were wondering, Windows 95 can't do this.)



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In other words: Apple is still developing the most innovative, user-friendly and consistently superior products on the market. That's one part of our system that won't change. To learn more, visit www.macos.apple.com.

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The Mystery of the $9.99 CD-ROM

Cheap discs? How good can they be? You'd be surprised.

PHOTO ILLUSTRATION JOHN KUCZALA

I KEEP WAITING for the price of new CD-ROMs to drop. I'm longing for the day when I can pick up any new game or reference title as nonchalantly as I purchase the latest home video or music CD. But that day isn't likely to come anytime soon. According to market researcher PC Data, the best-selling CD-ROM titles last spring averaged $43. That's not exactly an impulse buy for most of us—certainly not for me.

But you don't have to spend a small fortune to get a good CD-ROM title. In fact, with a little hunting you can find great values on both fairly new releases and not-so-new favorites. The trick is knowing where—and how—to shop for the bargains.

I used to walk right past the bins of bargain software and the racks of $9.99 jewel cases at the local CompUSA or Office Max store. Most of it was junk, I figured—DOS products well past their prime, and utilities from companies I'd never heard of before.

But lately I've noticed that scattered amidst the cases of no-name titles are some well-known and well-respected products.

On one recent shopping expedition, for example, I found several games and reference titles that, while slightly past their prime, still offer tremendous value. One of my favorites is WillMaker 5.0, a do-it-yourself will creation product from Nolo Press. Nolo is currently shipping version 6.0 of this popular program (I found the latest version at CompUSA for $35), but has licensed the earlier version to The Learning Company, which repackages it under the SoftKey label and then sells it at a deep discount. How deep? I found WillMaker 5.0 for just $9 at Price Costco. And the wills you create in version 5.0 are just as valid as the ones created in the current product.

What do you get for the additional $26 in the later version? Some ease-of-use enhancements and a few new features, like the ability to name coexecutors of your will or to choose different guardians for each of your minor children. While I'm sure some people will need these added capabilities, those of us with simpler needs can do just fine with the earlier version—and save a tidy sum in the bargain.

So what's in it for Nolo? Doesn't the low-price product cannibalize sales of the current WillMaker? Not necessarily, says Ann Heron, the company's director of software marketing. "By licensing the earlier version, we hope to get into markets that we wouldn't reach otherwise," she explains. Heron says that version 5.0 is sold *only* in stores like Target, K-Mart, and Price Costco, where consumers won't find the premium product. That's the theory, at least, but it may have some holes: I found a copy of 5.0 on the bargain rack at CompUSA, which also had the higher-price, later version for sale.

Nolo isn't alone in offering older products at reduced prices. Electronic Arts, Maxis, and Sierra all have low-price lines of their classic games, which they've moved from floppy disk to CD-ROM. They've tossed the bulky boxes ▶

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to save space and packaging costs and dramatically reduced the prices. Maxis, for example, now sells four of its popular Sim titles for $15 each and is considering adding more to its low-price Collector's line. Electronic Arts has roughly 30 products in its CD-ROM Classics line; these also sell for around $15 each. While some of the games are for DOS (they will run in Windows 95), most are Windows products that were best-sellers just a few years ago.

The Learning Company, which now consists of Compton's New Media, MECC, and SoftKey, has also aggressively marketed earlier releases of a few of its products in a Classics line. Older versions of its Reader Rabbit and Math Rabbit, Oregon Trail, Compton's Interactive Encyclopedia, and BodyWorks are selling for $14.95 on the street—up to 60 percent off original retail prices. Technical support is still available on the products, and in some cases you can upgrade to the latest version.

> Technical support is still available for most bargain discs, and you can often upgrade to the latest versions.

Let's say you buy the 1995 edition of Compton's Interactive Encyclopedia for $15 and later decide you want to upgrade to this year's (not a bad idea if you hope to stay abreast of current affairs). For an additional $29.95 you can get the 1997 edition. You wind up spending about $45—or roughly the same as paying for the new version at retail. Most people probably won't want to go through the hassle of buying an older product, filling out the upgrade coupon, and mailing in the receipt. But it certainly takes the risk out of buying a discounted older version.

CD-ROM BUYING TIPS

THERE ARE SOME important caveats, however, that apply to these older releases. Though all the companies mentioned here offer technical support on their low-price lines, that may not be the case for *all* bargain packages. You also won't get all the latest multimedia technology in these older products. (For that reason, though, they'll probably run better if you've got an older 486 PC.) And finally, a dog at any price is still a dog: Despite the great titles I found, there's still a lot of junk on those bargain racks, and some products have incompatibilities that could wreak havoc on your system. Think twice before buying titles you've never heard of.

Buying oldies but goodies isn't the only way to save money on CD-ROM titles. Here are tips for getting the best prices on all types of CD-ROMs.

All stores aren't created equal. More so than with books, records, or music CDs, pricing for CD-ROMs varies dramatically from one store to the next—and the bargains aren't always where you'd expect them to be. For example, stores like Target and K-Mart that offer competitive pricing on many noncomputer products aren't so competitive when it comes to CD-ROM titles. Myst, for instance, was selling for $29.99 at my local Target, while Price Costco had it for just $17.99. Warehouse stores like Price Costco and Sam's Club continue to have the lowest prices of any retailers on both new and older releases. And the selection is surprisingly better than at all-purpose retailers like Target, though even warehouse clubs are not as well supplied as computer superstores or software-only retailers.

Scope out the bundles. Just about all the stores that sell CD-ROMs are selling low-cost CD-ROM bundles—both compilations from several developers as well as single-company products. Be careful, though. Some of these bundles *look* great but aren't worth the money—you may find only one or two quality titles out of a mix of four or five in the package.

The bundles offered by software companies themselves are often the best deals, particularly since you stand a better chance of getting technical support. The two Price Costco stores I visited had several $33.99 Davidson software bundles, each featuring two children's educational CD-ROM titles. One set, a KidWorks Deluxe/Science Blaster Jr. combo, included a $10 rebate—not a bad deal for two fairly well respected titles that used to ▶

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AcerView 76ie	17" (15.7" Viewable Image Size)	1280x1024 @65Hz	iScreen® On-Screen	.27mm
AcerView 56e	15" (13.7" Viewable Image Size)	1280x1024 @62Hz	Digital Control	.28mm
AcerView 54e	15" (13.7" Viewable Image Size)	1024x768 @66Hz	Digital Control	.28mm
AcerView 34T	14" (13.1" Viewable Image Size)	1024x768 @60Hz	Analog Control	.28mm

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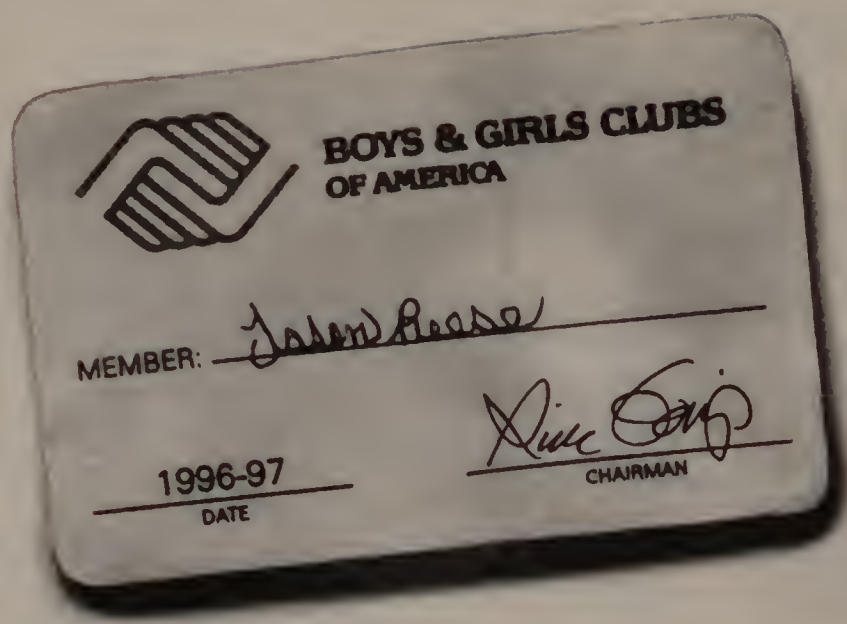

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- The Learning Company; 800/227-5609; www.learningco.com
- Maxis; 800/336-2947; www.maxis.com
- Nolo Press; 800/728-3555; www.nolo.com
- Sierra; 800/757-7707; www.sierra.com
- Sirius Publishing; 800/247-0307; www.siriuspub.com

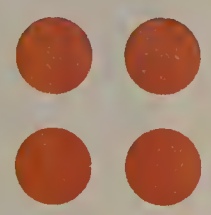
cost a lot more when bought separately.

Sirius Publishing's 5 Foot 10 Pack has topped best-seller lists for months. And why not? For $22.95 you get ten older CD-ROMs. The package includes a wide array of multimedia, games, and applications from such major companies as Microsoft and Warner Interactive. Even if you find only two of the included titles worthwhile, you still are ahead. The company has released a number of follow-up ten-packs, mostly with older CD-ROMs licensed from their original publishers.

Go to the source. Many CD-ROM developers are selling their own titles directly via toll-free sales lines and their Web sites. With the distributor and the retailer out of the picture, you can shave several dollars off the retail cost. Many companies frequently offer special promotional pricing through their Web sites that isn't available via retail stores.

Shop and save. Sooner or later, the price of new CD-ROM titles will drop to a reasonable level. Until then, it pays to shop around. You'll find some great deals on older products and discounts on the newer releases, too. Then maybe it won't hurt quite as much when you feel the need to buy a hot new title that you and your family just can't live without.

Have you found any great CD-ROM deals? E-mail your comments about this or any consumer issue to consumerwatch@pcworld.com. Roberta Furger is a PC World *contributing editor. Her book* Does Jane Compute? *will be published by Warner Books next February.* ■



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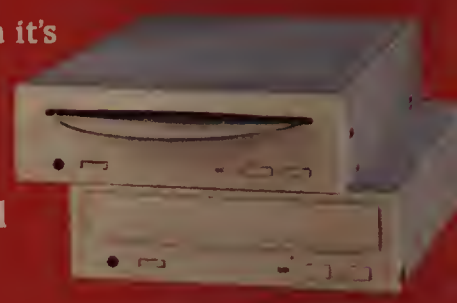

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U.S. Computer Direct scam? ◆ Dell disaster ◆ Kudos to TuneUp.com

I'VE BEEN ROBBED

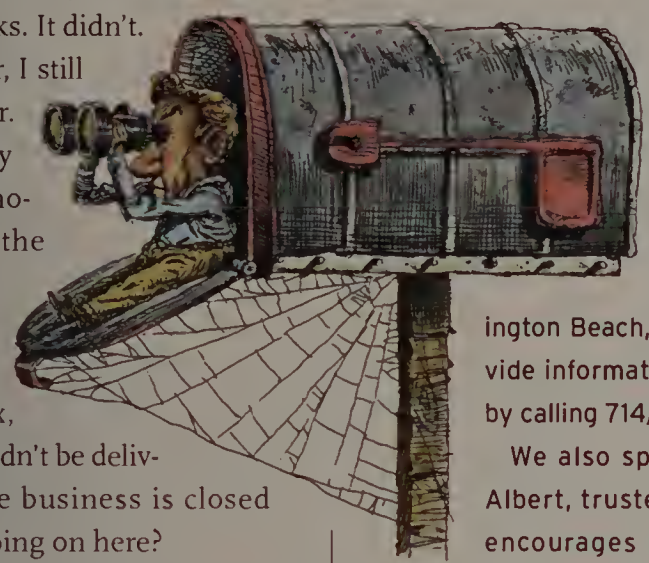
I ORDERED A Patriot Powerstation 3D LX system from U.S. Computer Direct in late February, after seeing an ad in *PC World*. I paid $1500 using my credit card. The salesman told me the system would arrive within three weeks. It didn't. Two months later, I still had no computer. Time to cancel my order. But now nobody answers the phone when I call. I sent a letter to the company via FedEx, but my letter couldn't be delivered because the business is closed down. What is going on here?

Samantha Nowakowski
Conshohocken, Pennsylvania

Editor's response: Nowakowski was not the only reader left high and dry by U.S. Computer Direct, based in Huntington Beach, California. Nine other USCD customers contacted *PC World* with similar stories; only two ever received a computer from the company. Both units broke down recently, and when the readers returned them for repair–you guessed it–they never heard from USCD again.

Shortly after the readers contacted us, the company filed for bankruptcy under Chapter 7. At press time no assets were available to pay back what is owed to customers.

The Huntington Beach Police Department is investigating this company. "Our office has been paralyzed with complaints from up to 150 customers around the country," reports Detective David Goss. "We want to hear from everybody who purchased from USCD."



If you haven't filed a complaint yet, send one to Detective Goss, Huntington Beach Police Department, P.O. Box 70, Huntington Beach, CA 92648; or provide information over the phone by calling 714/536-5951.

We also spoke with Theodor Albert, trustee for the case. He encourages people who lost money to USCD to file a claim directly with the bankruptcy court. Complete a proof of claim form (available in any stationery store) and submit proof of purchase, such as the invoice or packing slip. Send these items to U.S. Bankruptcy Court, 34 Civic Center Plaza, Room 506, Santa Ana, CA 92701. Make sure you include the bankruptcy case number, SA 97-16191 JW, and the full company name, USCD Corporation.

Fortunately, not all readers sent a check or money order to the company. At press time Nowakowski told us that her credit card company is currently investigating USCD and has temporarily removed the charge. She hopes the refund will be finalized soon.

NO CABLES, NO PC?

LAST MARCH I bought a Dell Dimension XPS Pro200n for my home office. It was advertised with an Ultra Wide SCSI hard drive, which would supposedly let me add up to 15 peripherals to my system using Adaptec's 2940US controller card. But when I opened the box, I couldn't find the cables I needed to hook up my existing peripherals. When I called Dell I was told, to my horror, that the company doesn't have the cables because "the technology is so new." I want my money back.

Susan Hagmann, Pompano Beach, Florida

Editor's response: We forwarded Hagmann's complaint to Dell. A spokesperson apologized to Hagmann for her frustration and explained that she could have gotten the cables she needed from Adaptec. Because of the wide variety of SCSI external devices and the multiple versions of cables needed to match them, Dell currently does not ship these cables with its Dimension PCs. "In Hagmann's case, Adaptec would have been able to identify and provide the necessary cables," the spokesperson said. But this procedure was not made clear to Hagmann. Dell gave Hagmann a refund, but she was still dissatisfied with the entire experience.

THUMBS UP, TUNEUP!

I DECIDED TO try TuneUp.com's free 60-day trial of its virus protection software. Near the end of the trial period, I started having problems with Windows 95's Registry on my PC. This gave me a chance to try out TuneUp.com's tech support. I was very impressed with the superb online tech staff: Through e-mail and phone conversations, they got me back up to speed in no time. They communicate in a language I can understand—and they also have a great sense of humor!

John McCallum
West Vancouver, British Columbia

Think you've gotten a raw deal—or a great one? PCW Advocate *wants to hear the details at advocate@pcworld.com. We'll investigate complaints and publish items of the broadest interest. Aoife McEvoy is a staff editor for* PC World. ■

ILLUSTRATION: JOHN S. CUNEO

THE FINE PRINT

MAIL-IN REBATES: GET YOURS

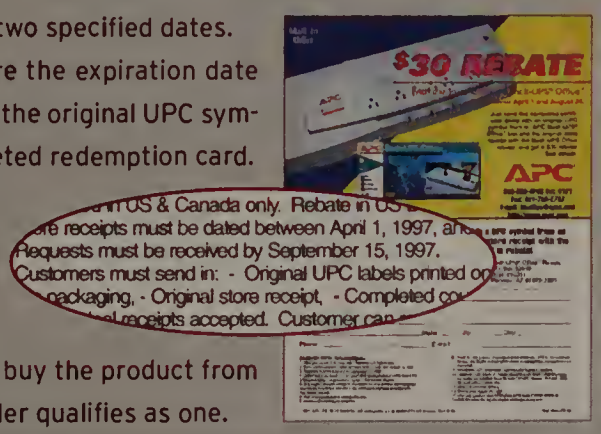
ADVERTISERS TRY TO entice you with rebates of all shapes and sizes. But we get lots of letters from people who never got the rebates they were expecting. Rebate procedures vary, so make sure you read the fine print and get your money.

This redemption card from American Power Conversion, for instance, offers a $30 rebate if you buy its Back-UPS Office unit between two specified dates.

1. Your rebate request must arrive before the expiration date *and* include all specified items–in this case, the original UPC symbol from the box, store receipt, and completed redemption card.

2. Turnaround time is six to eight weeks for this offer. However, according to complaints we've received, some companies can take a few months to issue a rebate.

3. Some rebate programs insist that you buy the product from an authorized reseller. Make sure your dealer qualifies as one.



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* Estimated street price. All performance tests conducted by Matrox Graphics Inc. on a Gateway 200 MHz MMX with 32 MB of RAM and 512K cache. Matrox Mystique 220 Business, Diamond Stealth 3D 2000XL, STB Nitro 3D, and ATI 3D ProTurbo + PC2TV were configured with maximum memory configurations using driver releases 3.41, 4.03.00.3105, 1.50K and 3.03 respectively. WinBench 97 business tests conducted at 1024 x 768 @16-bit at 75 Hz using small fonts under Windows 95. 3D WinBench 97 tests conducted at default resolution of 640x480 @16-bit at 75 Hz with DirectX™ 3a using small fonts under Windows 95. 3DWinBench settings were dictated by Quality Suite responses for the respective products.

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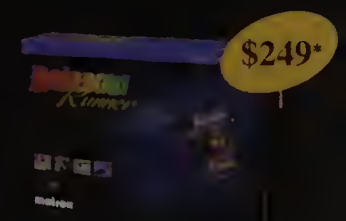

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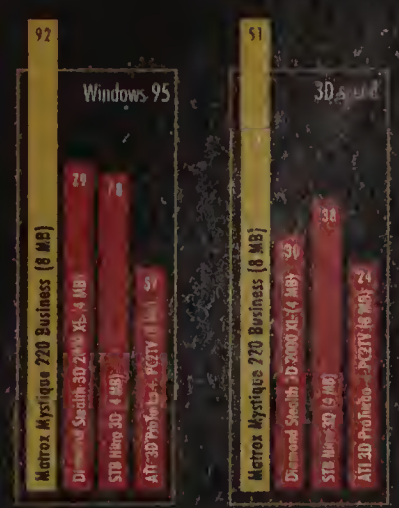

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760MT	166 MHz	1.3GB	12.1"TFT	$2,899
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730CDT	133MHz	1.0GB	12.1"TFT	$2,099
750CS	150MHz	1.0GB	12.1"DSTN	$1,799
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PC WORLD TOP 20

Designed for Microsoft Windows 95

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From Waiter to Web Site Designer

Using point-and-click authoring software, Bruce Lindsey was able to create an award-winning Web site in less than 40 hours—without any HTML experience.

PHOTOGRAPH: KEN FRICK

THE PROBLEM This story begins with a wine list and ends with a Web site—both of which have won awards. In between the two accomplishments was a challenge that many businesses face: How do you create a Web site without learning HTML or spending thousands of dollars hiring an expert? This month, Bruce Lindsey of Jay's Seafood in Dayton explains how he made the leap from waiter (albeit a technologically savvy one) to Webmaster—without even looking at a manual. —*Editor*

For four years in a row, the extensive wine list at Jay's Seafood has won a *Wine Spectator* award of excellence. It's an important honor because this highly regarded magazine has an international readership. Not long after Jay's received the first award, we started hearing from people who wanted a copy of our wine list. It's expensive and time-consuming to copy and mail out the lists. So I decided the best way to distribute the wine list was to put it on a Web site.

I've been using PCs since the early 1980s, so I'm fairly computer literate. Still, I knew absolutely nothing about building Web pages; I didn't have time to take a class, and hiring someone else to do it was too expensive (the lowest bid we got was $2000).

THE SOLUTION: DO-IT-YOURSELF WEB SOFTWARE

IN LATE SPRING 1996, I read about a new Microsoft program called FrontPage 1.1. Its selling point was that if you knew how to use a word processor, you could design a Web site with FrontPage. You don't need to know HTML—the software does all the dirty work. It was exactly what I was looking for. At the time, however, FrontPage was under development. There was no manual, and the help files hadn't been completed. I decided to download a beta version off the Internet and give it a try anyway.

As Microsoft promised, FrontPage has an interface similar to Word's: You start with a blank page, and there are toolbars with icons and a drop-down menu. The main difference, in terms of interface, is that FrontPage offers two ways to look at a document. The Explorer view uses a graphical interface that lets you see the folder structure of your Web page, including the hyperlinks and the contents. The FrontPage Editor view allows you to see your Web page just as it will look in a browser. You use the Editor to add and view forms, frames, tables, graphics, text, links, and other elements.

Once I became familiar with FrontPage, I downloaded Web pages that interested me and imported them into the Editor so I could study them. To get ideas, I looked at how page elements were positioned. Then I went to work.

Starting a Web page was as easy as opening a new document in Word: I just selected *New* from the File menu in the Editor. I already had the restaurant's menu and wine list stored as Word files on my PC. Originally, I had used Word's table features to create the wine ▶

lists—I had put each type of wine into its own table with columns for wine name, description, and price. For the Web site, I cut and pasted each wine category table into a new Word file, saved each file in HTML format, and imported the tables into FrontPage. I put each table on its own page within the site, linked to a table-of-contents frame. This makes it easy for visitors to go to the wines that interest them.

I also added a MIDI file to the contents frame and set it to play as a continuous loop, so visitors hear soft background music when the table of contents is on screen. Adding music was easy: I just imported the file and added it to the frame.

Years ago I had hand-drawn some maps of wine-country regions for the wine list, and I scanned and imported them in. I created some additional graphics using Corel Xara, a program for creating Web page images, and used some clip art.

Because it shields you from the HTML code, a program like FrontPage limits your design more than advanced applications. But for me, it's just right. I don't think I'll need to add any sophisticated touches like Java or Shockwave animations to the site, at least not anytime soon.

Within about 40 hours, I had finished the restaurant's Web site. I took the files to EriNet Online Communications (www.erinet.com), our Internet service provider. Before I even left the ISP's office, Jay's Seafood was on the Web.

EVEN MICROSOFT LIKED THE SITE

NOT LONG AFTER the restaurant went online, I heard Microsoft was sponsoring a contest for the best Web sites created with FrontPage. I submitted our site, and we were one of five winners. A day or so after Microsoft announced the winners, we got about 600 hits in one day. Since then, we've had a total of roughly 26,000 hits—and a number of new restaurant patrons who say they've seen our site.

The site (www.jays.com) has certainly served its purpose. Jay's doesn't do much marketing or advertising. When you consider that a newspaper charges $300 per column inch for a local ad, it doesn't make sense for us to advertise. Instead, we pay $860 a year to EriNet for 10MB of space on its server plus an Internet access account. We get to publish as much information as we want. The information is available to anyone anywhere in the world who has a computer, modem, and Web browser—and it's in color.

Edited by James A. Martin

• Microsoft FrontPage 97 With Bonus Pack $149 list; Microsoft; 800/426-9400; www.microsoft.com/frontpage

READER SERVICE NO. 606

James A. Martin is a PC World *contributing editor. If you've solved a problem in your business using a PC application or hardware device, we'd like to hear about it. We pay $300 for published columns. See page 14 for contact information.* ■

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Clarity you can count on

AOL4Free Is Trouble ◆ PowerPoint Vulnerable ◆ Windows NT Service Pack 3

Are We Secure Yet on the Internet?

HAVE YOU NOTICED that this column increasingly covers Internet security problems? Well, that's where the most dangerous bugs have been turning up lately, and it's a trend that's not going to go away. Just as using antivirus utilities has become a necessary inconvenience, fixing security flaws in your browser and other Internet-aware programs is now a requirement for safe computing.

FAKE AOL FREEBIE DELETES FILES

THOUGH IT STARTED as just another Internet virus hoax, the AOL4Free Trojan horse is now a real threat. The hoax started when Nicholas Ryan of Yale University distributed an illegal program that actually could get you onto America Online free of charge (Ryan pleaded guilty early this year). Soon a rumor started going around that a program called aol4free.com would delete files from your hard drive. Informed Netizens correctly determined the rumor to be false and got the word out. Unfortunately, somebody decided to capitalize on this sense of relief and created a program with the same name that really does delete files.

Unlike a virus, which infects files or boot sectors and reproduces itself, a Trojan horse is a destructive program masquerading as a useful one. You don't need a special program to protect yourself: Just search your hard disk for aol4free.com; if you find it, delete it. And don't launch e-mail attachments with that name.

IE'S PRESENTATION SECURITY HOLE

INCREDIBLE AS IT may sound, users of Microsoft's Internet Explorer browser need to install yet another security patch. This time, the hole lies in IE's ability to run PowerPoint presentations, which can themselves launch other applications. In other words, a cruel joker could create a Web page with a PowerPoint presentation, which in turn could launch a program that formats your hard drive, bypassing IE's own security safeguards. You don't need to have PowerPoint installed to be affected by the flaw—you just have to browse to a Web page containing PowerPoint data.

As we went to press, no Web sites that exploit the flaw were known to exist—but now that the word is out, it's more likely that one will turn up. You can protect yourself by downloading a quick-and-dirty (153K) Internet Explorer patch from www.microsoft.com/ie/security/powerpoint.htm. Once you've installed the patch, IE will display a warning before opening PowerPoint files, giving you a chance to abort the process. A similar fix for PowerPoint itself is in the works.

WINDOWS NT SERVICE PACK 3 ON THE WAY

WINDOWS NT 4.0 hasn't even turned one year old yet, but its third collection of bug fixes is already here. Service Pack 3 contains nearly 200 fixes and enhancements, including plugs for two serious Internet security gaps that cropped up just before its release. If your Windows NT Workstation or Server machine is directly connected to the Internet or another network, hackers can gain access to sensitive Registry data and other files without providing a user name or password. Security software developer Midwestern Commerce discovered the flaw, named it the Red-Button Bug, and posted both an explanation and a demonstration program (www.ntsecurity.com/RedButton).

The second hole permits crafty hackers to crash Windows NT servers, a situation that doesn't threaten data on the machine but denies access to regular users. The problem also extends to Windows 95 and 3.1 PCs connected to the Internet; Microsoft had no fix for those operating systems as we went to press.

For NT fixes, go to www.microsoft.com/NTServerSupport/Content/ServicePacks/Default.htm to download the (hold on to your hard disk) 18MB Service Pack 3, U.S. Intel version. For $20, you can also order it on a CD-ROM by calling 800/370-8758.

Files mentioned in this article are available on PC World Online (www.pcworld.com/files). Scott Spanbauer is a contributing editor for PC World. ■

IN BRIEF

Free Agent 1.11 and Agent 1.01

FORTE HAS POSTED a minor upgrade to its freeware Usenet newsreader Free Agent (www.forteinc.com/getfa/getfa.htm). Version 1.11 fixes buglets involving the number of newsgroups in the 16-bit version and repeating message headers. Agent 1.01 (www.forteinc.com/store/getagent.htm) likewise stamps out numerous nonfatal but irritating problems in version 1.0.

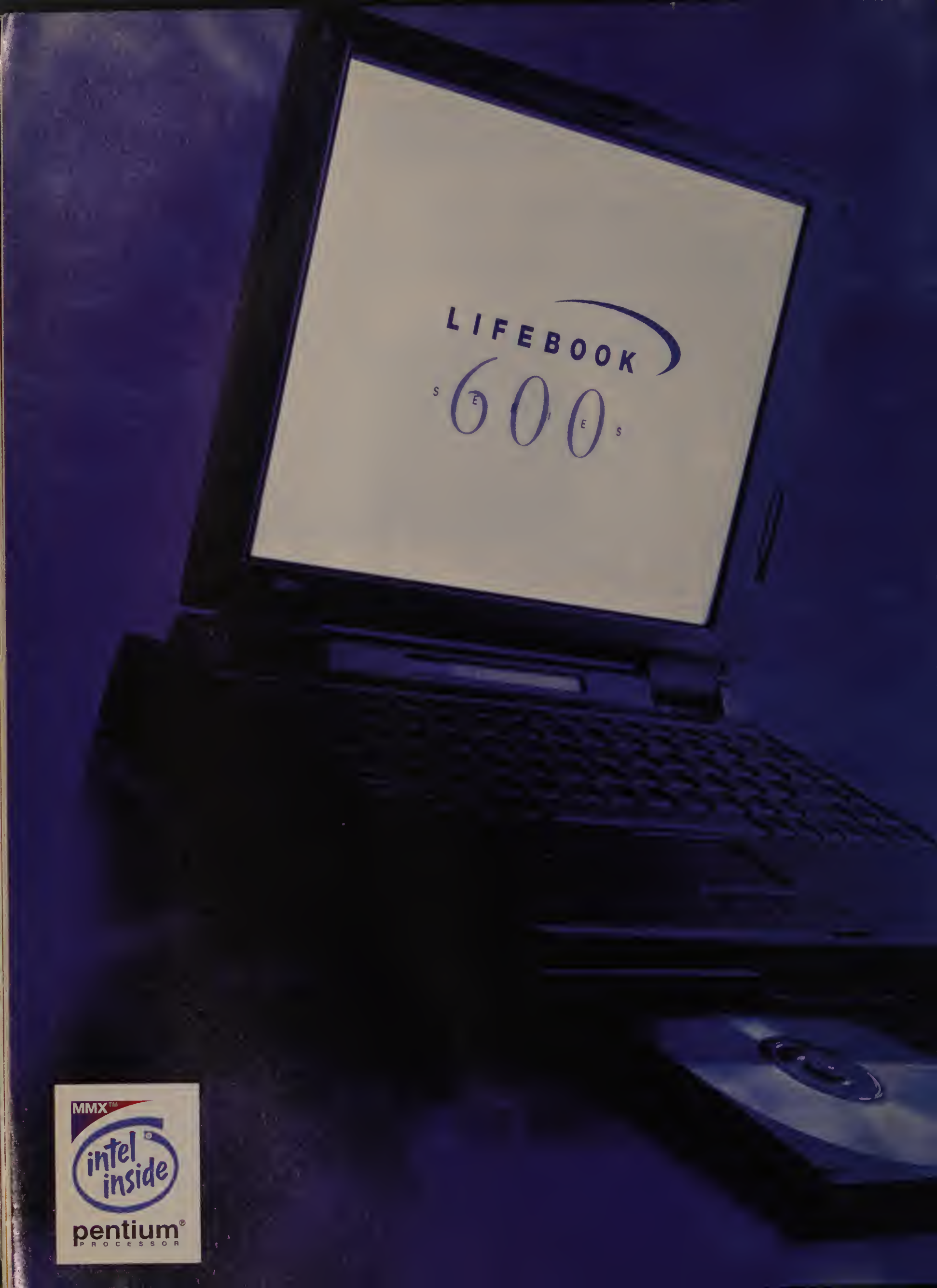
Jaz Drive/FAT32 Fix Changes URL

I REPORTED IN May that Iomega Tools for Windows 95 had incompatibilities with Jaz drive FAT32 partitions, and I recommended an upgrade to version 5.2 ("FAT32 Health Hazards"). The upgrade has moved to a new spot on Iomega's Web site, www.iomega.com/support/software/ftp.html.

BUGGED?

FOUND A HARDWARE OR SOFTWARE BUG? Tell us about it via e-mail at bugs@pcworld.com.

ICON: JEFFREY PELO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TOP OF THE NEWS

Cyrix Powers $2100 Pentium II-Class PCs

Cyrix's fast "M2" CPU poses a new challenge to Intel's dominance and could push PC prices downward.

FIRST SHIPPING 6X86 SYSTEM: The CyberMax Max C5 200+ MMX.

FIRST LOOK

THERE'S A NEW entry in the CPU sweepstakes that's making a big impression. The Cyrix 6x86MX (formerly codenamed M2) sets a new standard for microprocessor price/performance and could shake up this volatile market. The chips offer top performance in PCs that cost hundreds of dollars less than equivalent systems based on the Pentium MMX-233, Pentium II, or AMD K6.

Loaded CyberMax PCs based on the 6x86MX should be available by the time you read this. These systems are expected to sell for $1900 to $2250. Value-conscious shoppers will find even more value in August when complete entry-level PCs from CTX hit the street; these machines should offer PMMX-166 performance for as little as $1300.

As with Cyrix's prior 6x86 line of Pentium-class CPUs, the company has given its 6x86MX chips model numbers reflecting where the chips will compete in the overall CPU market, rather than indicating actual clock speeds. The 6x86MX-PR233 runs at 188 MHz but will compete with the K6-PR233, the PMMX-233, and the PII-233. The 6x86MX-PR200 runs at 166 MHz and will compete against the K6-PR200 and PMMX-200. The entry-level 6x86MX-PR166 (not available for testing at press time) runs at 133 MHz and should compete against the PMMX-166.

CYRIX IS SPEEDY

DON'T CONFUSE slower clock speeds with slow performance. In testing with the PC WorldBench suite of business apps, a Cyrix 6x86-PR233 prototype PC scored an impressive 252, edging out the PII-233 systems, which had an average score of 247, as well as the AMD K6-PR233 PCs, with average scores of 249. (The Cyrix

PHOTOGRAPHS: BEVERLY HARPER; ICONS: JEFFREY PELO

EDITED BY
Charles Piller, Randy Ross, and Bill Snyder

EXTRA CACHE POWER: Cyrix gave the 6x86MX a 64K primary cache, twice the Pentium II's 32K. **FASTER BUS SPEED:** The 6x86MX-PR233 uses a 75-MHz system bus—faster than the 66-MHz standard used by Intel and AMD. **PENTIUM AND PENTIUM MMX COMPATIBLE:** Like AMD, Cyrix used the Socket 7 design, the standard for existing Pentium- and Pentium MMX-class systems.

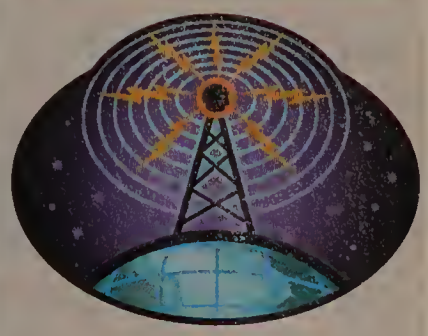
had 32MB of RAM and 512K of secondary cache, a 4.5GB Ultra Wide SCSI hard disk, and an STB Nitro 3D video adapter with 4MB of VRAM.) The Cyrix PR233 scored less than 4 percent below the 261 average of PII-266 systems we've tested. These are all impressive machines; most users will not notice a few points' difference. Cyrix PR233–based systems costing about $2100 to $2250 should deliver performance equal to or better than comparable AMD K6-PR200 and -PR233, PMMX-200 and -233, and even PII-233 systems that cost between $2188 and $3100.

The PC World Test Center also evaluated a CyberMax production unit, the $2099 Max C5 200+ MMX, using Cyrix's 6x86MX-PR200 chip. The CyberMax (which, like the Cyrix prototype, came with 32MB of RAM and a 512K secondary cache) had a 241 PC WorldBench score. This beats the 231 average for PMMX-200 PCs and equals the performance of the AMD K6-PR200–based Polywell Poly K6200Mx, which sells for $2188.

MMX SURPRISE

IN ORDER to test the 6x86MX's performance on multimedia applications tuned for MMX, we ran ▶

JUST IN



Microsoft's Big Cable Investment

MICROSOFT PLANS to invest $1 billion in Comcast, the fourth-largest U.S. cable television operator. This may not accelerate the widespread availability of PC products or services such as high-speed Net access. Despite numerous cable-modem trials in progress, consumers won't see widespread cable-based Net access until the year 2000, says Aberdeen Research analyst Virginia Brooks.

The 67-kbps Modem

TRANSEND IS shipping a $595 modem that sends and receives data at up to 67 kbps over telephone lines, the Rockledge, Florida-based vendor says. The Transend 67 uses a technique that treats two phone lines like one, says company president Tom Bradford. The external unit works as a 33.6-kbps unit but has a jack for the second line needed for higher speeds. Transend will sell the modem directly (800/357-2671). ISPs will need Transend modems to use the connections; at present only a couple of Florida-based ISPs support the Transend 67.

User-Friendly Camera

DIGITAL CAMERAS are fun, but downloading images can be a hassle. Sony has a solution ▶

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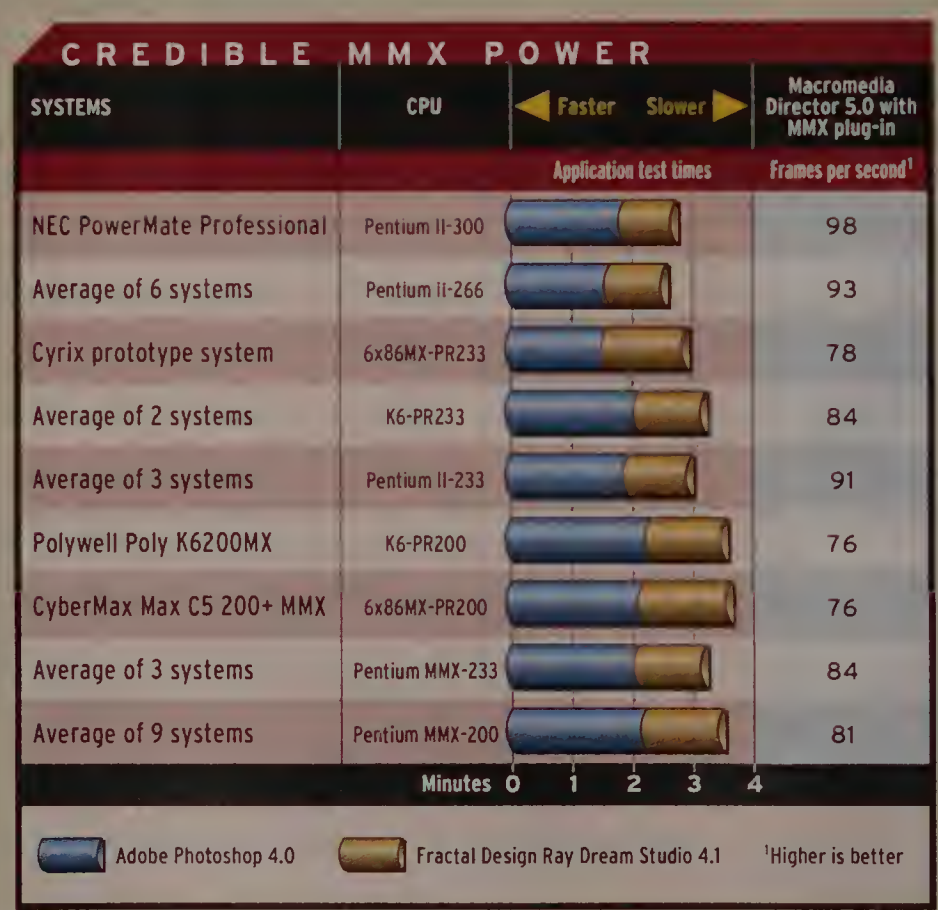
Cyrix 6x86MX: Amazing Performance for the Price



How We Test

Business applications: We tested all systems with PC WorldBench, PC World's Windows 95 application-based benchmark. Higher scores are better. For a description of PC WorldBench 1.0 tests, see PC World Online (www.pcworld.com).

Multimedia applications: We tested each system using a series of MMX-enabled applications. In Adobe Photoshop 4.0, we time several image editing operations. In Fractal Ray Dream Studio 4.1, we time how long it takes to redraw rendered 3-D scenes at two levels of complexity. In Macromedia Director 5.0, we play a graphics-intensive Director executable file.

Data based on testing conducted by the PC World Test Center. All rights reserved.

the *PC World* MMX test suite. With Macromedia Director, the Cyrix prototype offered performance nearly identical to the PMMX-200 and K6-PR200 systems'. But it was about 7 percent slower than the average for PCs using the PMMX-233 and AMD K6-PR233. The Cyrix prototype performed similarly in rendering tests that used Fractal Design's Ray Dream Studio.

However, in the Adobe Photoshop tests, the Cyrix prototype blew away its competition. It was about 39 percent faster than the PMMX-200 unit, some 31 percent faster than the average for PMMX-233 and K6-PR233 systems, and 21 percent faster than PII-233 systems. The Cyrix PR233 even bested the PII-266, coming out with a 2 percent edge.

The CyberMax Max C5 200+ MMX competed credibly in multimedia testing. In Photoshop tests, it edged out the AMD K6-PR200–based Polywell PC and the average for PMMX-200 units. In Director testing, it tied with the Polywell and fell slightly behind the PMMX-200 average. In Ray Dream Studio rendering tests, it fell a bit further back, to about the average speed of a PMMX-166–based unit.

CYRIX DESIGN TRICKS

CYRIX DESIGNERS use a variety of tweaks to wring extra performance out of slower clock speeds, including a 64K primary cache, twice the Pentium II's 32K. In the 6x86MX-PR233, Cyrix uses a 75-MHz system bus—faster than the 66-MHz standard used by Intel and AMD.

Like AMD, Cyrix has made it easy for PC manufacturers to incorporate the 6x86MX into existing motherboards by using a Socket 7–compatible design, the standard for existing Pentium- and PMMX-class systems. This differs from the PII's slot-mounted cartridge, which requires a new generation of motherboards. Socket 7 compatibility also holds out the tantalizing possibility that people who have slower PCs will be able to upgrade their systems to 6x86MX power. According to a Cyrix spokesperson, the company expects third-party chip vendors to supply plug-in 6x86MX upgrades in the future.

If you use multimedia heavily and price is no object, a

Pentium II-300 Breaks WorldBench Records

LIKE ATHLETES in a silicon Olympics, the newest PCs benchmarked by the PC World Test Center keep breaking records. And not surprisingly, the first system we tested based on Intel's Pentium II-300—the NEC PowerMate Professional—set a new standard, though not by much. The prototype system, with 32MB of RAM and 512K of secondary cache, came in with an overall PC WorldBench score of 271, 4 percent faster than an average of six Pentium II-266 systems previously tested.

In MMX testing, the NEC unit set a new record in Macromedia Director performance, with 98 frames per second. Likewise, it topped Pentium II-266 speeds for Fractal Design Ray Dream Studio rendering tests. In Photoshop, however, the Pentium II-300 system slipped about 13 percent below the Pentium II-266 average and 14 percent below the Cyrix PR233-based prototype system—possibly due to superior hard drive controllers in those units and the use of a preproduction video card in the NEC machine.

A NEC spokesperson says the Pentium II-300-based systems should be available in September or October, with prices in the $4000 to $4100 range. But before you shell out such big bucks, find out which chip set is in the box. The prototype system we tested uses Intel's FX chip set, which does not support the Accelerated Graphics Port protocol; by fall, the new LX chip set should support AGP.

—Stan Miastkowski and Bill Snyder

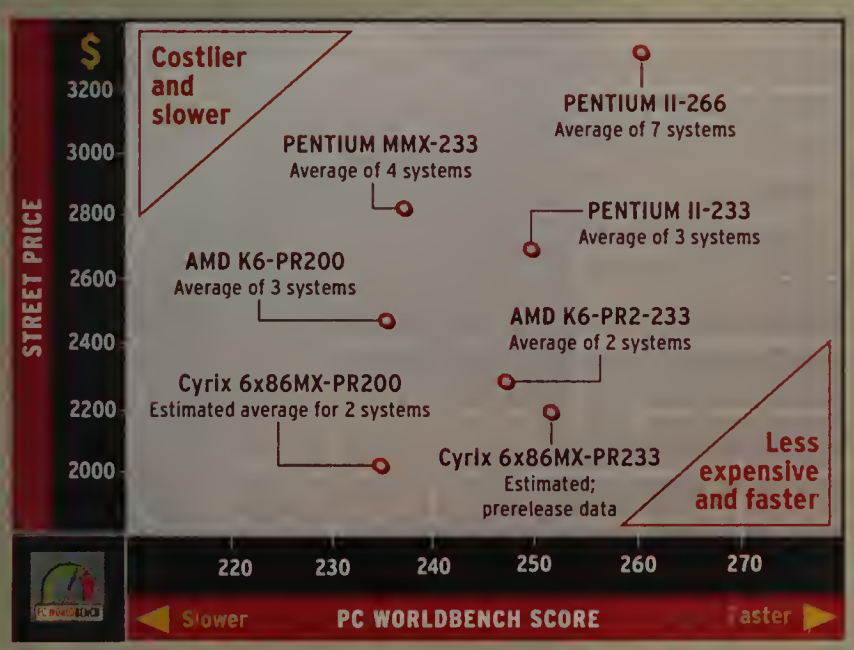
Pentium II-266 unit is still your best bet. But it appears that at least for the immediate future Cyrix 6x86MX–based systems will offer the best price/performance on the market. The CyberMax Max C5 200+ MMX shows how attractive Cyrix-based pricing is. The $2099 6x86MX-200 system includes a Matrox Millennium graphics card with 4MB of video RAM, a 6GB Seagate EIDE hard disk, a Toshiba 16X CD-ROM drive, a 32-bit Ensoniq sound card, a 56-kilobits-per-second (K56flex protocol) modem, a 17-inch Princeton monitor, Altec-Lansing speakers, and an extensive selection of software. This configuration represents slightly better pricing than that of a similarly equipped, but slower, Pentium MMX-200 PC.

A Cyrix PR233 version of the CyberMax unit should cost about $100 to $150 more—making it even more compelling than the PR200-based system. At press time, comparably equipped PMMX-233, PII-233, and PII-266 PCs—which offer performance similar to the Cyrix PR233-based systems'—were selling for several hundred to more than a thousand dollars above that. Polywell's Poly K6233Mx—a comparable K6-PR233–based system—sells for $2369.

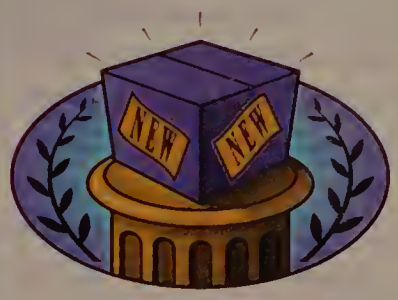
CTX plans to release three 6x86MX-based systems for shipment on August 1 with attractive pricing for a range of users. The low-end LCM166, based on the 6x86MX-PR166, is expected to sell for $999 and will include 16MB of RAM, a 2.1GB hard disk, a ▶

Let Price/Performance Be Your Guide

CHOICES, CHOICES: Sure, there are more x86 chips on the market than ever before. But that's no reason to be confused. We have analyzed the price/performance ratio of dozens of systems powered by seven key CPUs. One conclusion: Systems based on AMD and Cyrix processors offer a lot of value and warrant a serious look.



with the Digital Mavica, the first digital camera that saves photos to a 3.5-inch floppy. Each disk holds up to 40 images at 640 by 480 VGA resolution and 24-bit color depth. The unit will be available in two versions. The $599 MVC-FD5 should be out in late July. The $799 MVC-FD7, with a 10X optical zoom lens and five preprogrammed exposure settings, will be available in late August.



Dictation Software Heats Up

IBM HAS announced ViaVoice, its first mainstream speech recognition product to let you dictate to a PC without pausing between words—for only $199. ViaVoice will compete with Dragon Systems' $695 NaturallySpeaking, the first mainstream product of its kind. Meanwhile, Kurzweil Applied Intelligence, the other key player, expects to offer a similar product by mid-November.

TidBytes

TORNADO DEVELOPMENT'S low-cost universal in-box service combines e-mail, fax, voice mail, and pager functions. Tornado's Electronic Messaging System costs $10 per month plus a one-time setup fee of $15. WHEN SIZE MATTERS: Quantum and IBM both announced 3.5-inch drives that can hold up to 8.4GB, the highest capacity available in this width. Quantum's Fireball SE will be out in November; it will list for $569 to $659, depending on the interface. IBM will offer a retail version of its $675 8.4GB Deskstar 8 in early 1988.

12X CD-ROM drive, a 2MB generic video card, a 33.6-kbps modem, a sound card, and speakers. (CTX prices do not include monitors. CyberMax plans to offer a similar model, with monitor, for about $1300.) CTX will also offer the PR200-based LCM200 for $1299, which includes 32MB of RAM, a 2.5GB Maxtor hard disk, Matrox Mystique 2MB graphics card, and other features included in the PR166 version. The high-end PR233-based CTX LCM233 will go for $1499 with 32MB of RAM, a 4GB Maxtor hard disk, a 16X CD-ROM drive, and other peripherals included with the LCM200. By early fall, versions with a DVD-ROM drive should be available for about $400 more.

WILL VENDORS JUMP?

SPEED AND VALUE are fine, but will the Cyrix processor catch on with the big PC vendors who can make 6x86MX-based systems widely available? So far only CyberMax and CTX have committed to selling 6x86MX-based systems in this country. Cyrix's biggest hopes lie in first-tier system vendors, such as Acer, Compaq, and IBM, that have used other Cyrix chips.

Can **aggressive pricing** by AMD, Centaur, and Cyrix affect **Intel's hegemony?**

Meanwhile, at press time, Centaur Technology was beta-testing its IDT-C6 line of MMX-compatible processors, which are expected to become available this fall in 150-, 180-, and 200-MHz versions. The IDT-C6 chips would power complete systems in the $1000-and-below range, and they use a simpler design that consumes less power than their competitors. Centaur president Glenn Henry expects that IDT-C6 chips could sell for $100 or less—half the price of comparable Cyrix chips.

Can aggressive pricing affect Intel's CPU hegemony? Publicly, Intel has largely ignored its competitors, allowing AMD and Cyrix to slug it out at the low end while it concentrates on its cutting-edge CPUs. But the AMD K6 and the Cyrix 6x86MX are high-performance chips that hit Intel where it lives. And both Cyrix and AMD plan to roll out faster versions of their processors by late this year.

Although Intel has had a policy of quarterly price cuts on commodity chips as new technologies are introduced, its premium CPUs have remained expensive. Can Cyrix's and AMD's pricing policies put pressure on Intel's Pentium II prices in the near term? Linley Gwennap, editor in chief of *Microprocessor Report*, doesn't think that either company will dent Intel's overwhelming share of the CPU market, and expects Intel to hold steady on its Pentium II pricing.

Still, Intel is clearly not immune to competition. When AMD announced its K6 CPU in the spring, Intel followed with larger-than-usual price cuts on its Pentium-class processors. At press time, Intel announced new deep cuts in Pentium MMX chips, slated for August 1. So if you're a PC buyer, any competition in the chip business is good news. Given today's red-hot price/performance derby, get ready to work down your wish list for affordable power systems.

—*Stan Miastkowski*

PHOTOGRAPHS: (TOP LEFT) BEVERLY HARPER; (BOTTOM LEFT AND RIGHT) DONNA TEREK

Spam Attack: Get Ready for the Bulk E-Mail Deluge

CONSUMER ALERT

JIM YOULL WAS sick and tired of receiving unsolicited bulk e-mail, or *spam*. The Web site developer asked to be removed from the senders' mailing lists, to no avail. So to fight back he created an antispam Web page (www.agentzero.com/junkmail).

Then the nightmare began. An anonymous spammer sent out thousands of bogus junk e-mail messages, using Youll's return address. Youll's mailbox was deluged with complaints and undeliverable mail. His Internet service provider threatened to cancel his account. The phony spam included Youll's phone number; angry calls and even death threats came in.

This is just one skirmish in the growing war between frustrated e-mail users and aggressive spammers. One bulk e-mailer, Philadelphia-based Cyber Promotions, sends 4 million messages per day, says its president, Sanford Wallace. Wallace presides over a network of bulk e-mailers called ISPam, which he says "is the conduit for between 15 and 20 million e-mails per day." Factor in independent operators, and you've got a torrent that wastes e-mail users' time and contributes mightily to Internet congestion.

Online services and Internet service providers have responded by terminating accounts of subscribers who are sending spam and by taking spammers to court. Politicians have proposed antispam bills. But bulk e-mailings continue to proliferate, and for now the best antispam measures are ones that you can take personally (see "Spam-Fighting Tips").

Jim Youll, spam victim

Spam-Fighting Tips

YOU CAN'T stamp out spam, but you can take measures to reduce the amount of it in your diet.

- **Delete** your America Online member directory profile.
- **Forward** spam to your provider so it can take action.
- **Post** on Usenet carefully. Configure your newsreader so that your e-mail address doesn't appear in the posting's From field. If you want people to reply, place your e-mail address at the end of the posting and disguise it; for example, you could type username-at-domain.com.
- If you **supply** your e-mail address to a Web site, look for and uncheck any box that refers to sending information on products of interest to you.
- **Set up** an e-mail filter that automatically deletes e-mail coming from addresses from which you've received spam.
- **Download** a utility called Spam Hater from PC World Online (www.pcworld.com/files). It attempts to trace spam headers and enables you to reply.

E-MAIL IS CHEAP

HOW DID SPAM get out of control? Unlike bulk postal mail, spam costs little to send. Numerous companies sell lists of e-mail addresses, often advertising them through bulk e-mail. Spammers also create lists using software robots that glean addresses from Usenet newsgroups and Web pages.

America Online, CompuServe, and Prodigy users are all prone to spam. It's easy to cull addresses from chat room logs and from AOL's membership directory, where users list their birth dates, hobbies, marital status, and computer configuration—details that Wallace calls "a direct marketer's dream." After getting addresses, a spammer need only set up an e-mail account with a service provider and send off a pitch.

Replying to a spam and demanding to be removed from a mailing list is usually futile: The spam's address and headers are often false; many bulk e-mail programs insert them automatically. And it's easy for a spammer to hide behind *your* address, as Youll discovered. The Internet itself makes it easy for spammers to hide. Most e-mail servers can relay messages through other servers, and spammers exploit this by sending their e-mail through third-party ISPs. The service provider's resources are taxed, and e-mail users see *it* as the source.

Phil Lawlor, direct marketing promoter

ISPS FIGHT BACK

SEVERAL service providers have won injunctions prohibiting Cyber Promotions from routing the unsolicited bulk e-mail through their systems. Most providers have antispam policies: If you use your account to send spam, you're cancelled. Of course, spammers can spew millions of messages before being cut off—and then they can move to another ISP. Some providers have reconfigured their mail servers to prevent them from being used to relay third-party mail. Unfortunately, this can also keep legitimate customers from checking their e-mail through third-party ISPs.

While most providers see spam as a scourge, some see it as an opportunity. Dearborn, Michigan–based Apex Global Internet Service is one of the world's largest Internet backbone providers. In April, AGIS enraged the antispam community by announcing that it would work with bulk e-mailers. AGIS supplies Net access to some of the largest spammers, including Cyber Promotions. It also helped organize the Internet E-Mail Marketing Council, a trade organization founded to "legitimize bulk e-mail as a marketing tool," says Phil Lawlor, AGIS's president and CEO.

The IEMMC is compiling a list of users who do not wish to receive spam, but many antispam activists suspect their motives. "We laugh about that," says John Lebkowsky, vice president of Electronic Frontier Foundation–Austin, a Texas-based Internet civil liberties group.

THE LAW STEPS IN

LAWMAKERS HAVE proposed antispam measures, but state bills would ban only spam that originates and ends within that state. Two federal bills promise sharper teeth: One would outlaw spam; the other would require the spam's subject field to begin with the word *advertisement*, to enable users and ISPs to set up spam filters. A ban would reduce Internet traffic and not require e-mail filters, but it introduces thorny free-speech issues. Tagging doesn't ease congestion and requires ISPs to install software whose costs could be passed on to consumers.

The Federal Trade Commission is also considering antispam regulations. But federal action can't stem the rising tide of offshore bulk e-mail. "It's going to be very difficult to legislate the use of junk e-mail...because it goes beyond the jurisdiction of the United States," says AGIS's Phil Lawlor.

Where will it all end? Not with the demise of spam. Today's spammers are determined to stay in business, and many companies anticipate the day when laws and Internet culture make it feasible to sell the thousands of e-mail addresses that they've collected through registration forms on their Web sites. As Cyber Promotions' Wallace says, "This is just the beginning."

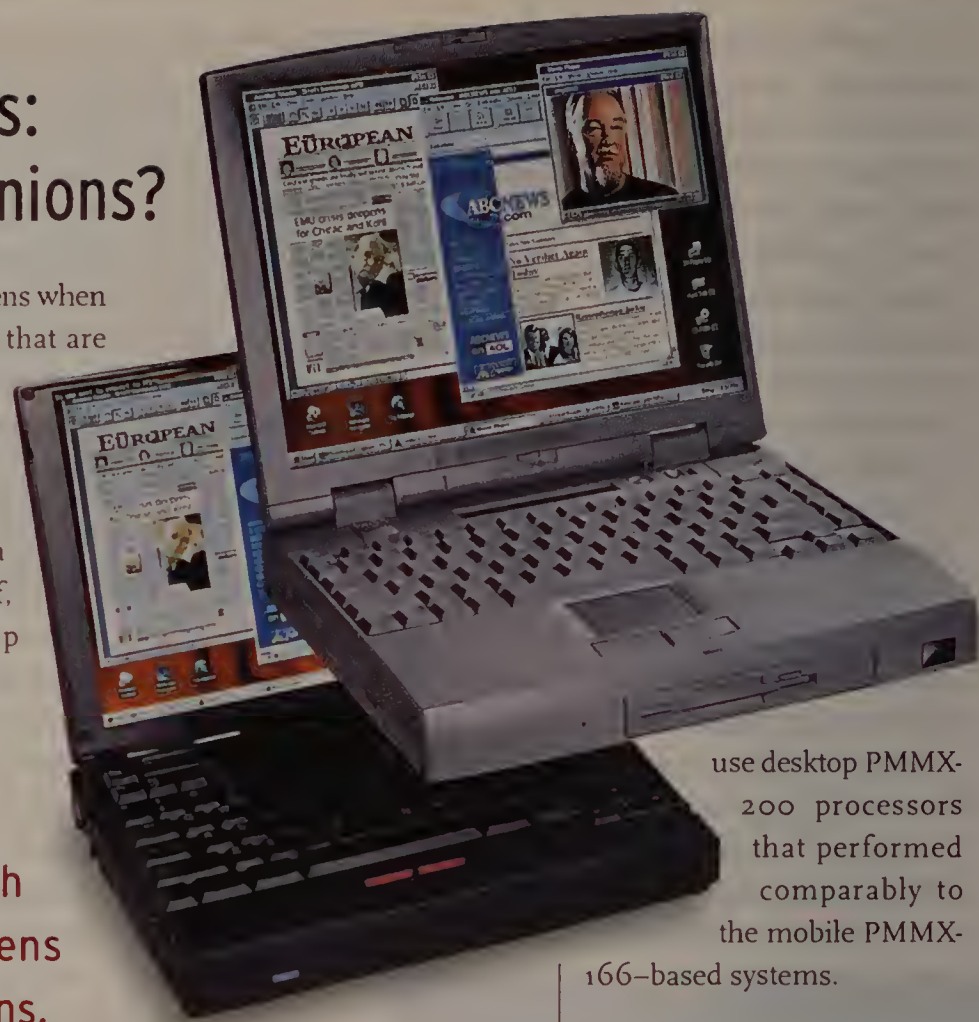
—*Jim Heid* ▶

Big-Screen Notebooks: Ultimate Traveling Companions?

LOOKING FOR the big picture in portable PCs? Then you have probably had your eye on one of the new notebooks with 13.3-inch screens, the largest yet. With a viewable area comparable to many 15-inch desktop monitors, plus Pentium MMX processors and multimedia hardware, big-screen notebooks have definite advantages for anyone who frequently gives presentations to small groups. The large screens also make working with spreadsheets easier, and in general help you perform visually demanding tasks that can overwork your eyes and patience.

But these heavy-hitting new portables are also just plain heavy. They weigh in at over 9 pounds. Moreover, as desktop replacements, the units have limitations. The products we examined are considerably more expensive and slower than today's newest Pentium MMX-200 and Pentium II desktop PCs—and the price/performance gap widens when you look at desktops that are based on AMD's K6 and Cyrix's 6x86MX chips. With mobile Pentium 200- and 233-MMX chips still a couple of months off, the performance gap remains a concern.

As desktop replacements, notebooks with 13.3-inch screens have limitations.



NEC 6200MX (top right), IBM ThinkPad 760XD with 12.1-inch screen.

We tested five notebooks with 13.3-inch screens: the 5D Technology ChemBook 9750, ARM Computer's ARMNote TS9750, EPS Technologies' Apex M-200, NEC's Versa 6200MX, and Toshiba's Tecra 740CDT. (For more on the Toshiba, see this month's Top 20 Notebooks.)

All five notes sport bright, 13.3-inch active-matrix screens that support 65,536 colors and a maximum resolution of 1024 by 768. The tested units all include removable 10X CD-ROM drives. All offer built-in 16-bit sound systems and software support for MPEG motion video. Prices range from $3880 to $5899. Three of the systems use mobile versions of the Pentium MMX-166; the ARM and EPS notebooks use desktop PMMX-200 processors that performed comparably to the mobile PMMX-166–based systems.

LOOKING GOOD

THE VIEWABLE AREA of a 13.3-inch screen is about 20 percent larger than that of a 12.1-inch screen. Although some 12.1-inch displays support the same maximum resolution of 1024 by 768, this level of detail is more practical on larger screens.

When high resolution combines with adequate screen real estate, you can pack more information into presenta- ▶

13.3-INCH SCREENS TAKE YOUR SHOW ON THE ROAD

NOTEBOOKS	Street price[1]	CPU	Traveling weight (pounds)[1]	RAM (MB)	Hard drive (GB)	Maximum colors (1024 x 768)	CD-ROM drive speed	Modem	Reader service number
5D Technology ChemBook 9750 800/787-5335 www.5Dtech.com	$3880	Pentium MMX-166	9.4	32	1.4	65,536	10X	33.6-kbps PC Card	741
ARM Computer ARMNote TS9750 800/765-1767 www.armcomputer.com	$4199	Pentium MMX-200	9.6	32	2.1	65,536	10X	33.6-kbps PC Card	742
EPS Technologies Apex M-200 800/447-0921 www.epstech.com	$3895	Pentium MMX-200	11.8	48	2.1	65,536	10X	33.6-kbps PC Card	743
NEC Versa 6200MX 800/632-4636 www.nec-computers.com	$5699	Pentium MMX-166	9.4	32	2.1	65,536	10X	none	744
Toshiba Tecra 740CDT 800/457-7777 www.computers.toshiba.com	$5899	Pentium MMX-166	11.2[2]	16	2.1	65,536	10X	28.8-kbps internal	745

[1] Includes computer, AC adapter, power cord, floppy drive, and CD-ROM drive. [2] Also includes clip-on video camera, headphone adapters, and earphones. All products: 912

PHOTOGRAPH: BEVERLY HARPER

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- Smart Lithium Ion Battery
- ★ **MS® Office 97 Small Business Edition**
- Microsoft® Windows® 95
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NOW WITH MMX TECHNOLOGY. According to the trendspotters, things are speeding up in the notebook business. For proof, look at the new Dell Latitude LM M166ST. Its heart beats at an astounding 166MHz, thanks to its new Mobile Pentium® processor with MMX™ technology for gut-wrenching multimedia. It also has a new 12X Variable CD-ROM drive—again, among the fastest you can get in a portable. Then there's the new 128-bit graphics accelerator for faster and better color resolution and 64,000 colors. To order, call today. But do it fast. You don't want to lag behind the trend, do you?

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PC World Tests Yield Mixed Results

13.3-INCH-SCREEN NOTES PACK POWER...

SYSTEMS	CPU	RAM (MB)	PC WorldBench score
NEC Versa 6200MX	Pentium MMX-166	32	212
Average of 3 desktops	Pentium MMX-166	32	207
EPS Technologies Apex M-200	Pentium MMX-200	48	206
Average of 3 notes with 12.1-inch screens	Pentium MMX-166	32	201
ARM Computer ARMNote TS9750	Pentium MMX-200	32	199
5D Technology ChemBook 9750	Pentium MMX-166	32	196
Toshiba Tecra 740CDT	Pentium MMX-166	16	190

All systems had 256K secondary cache.

Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows · Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

...BUT USE PLENTY, TOO

SYSTEMS	CPU
NEC Versa 6200MX	Pentium MMX-166
EPS Technologies Apex M-200	Pentium MMX-200
ARM Computer ARMNote TS9750	Pentium MMX-200
5D Technology ChemBook 9750	Pentium MMX-166
Toshiba Tecra 740CDT	Pentium MMX-166
Average of 10 notebooks[1]	Pentium MMX-166

[1] 12.1-inch screens

poor · satisfactory · good

How We Test

Performance: We tested all systems with PC WorldBench, PC World's application-based benchmark. Higher PC WorldBench scores are better. For a description of PC WorldBench 1.0, see PC World Online (www.pcworld.com/testing).

Battery life: We drain and fully recharge the battery twice and set power-saving options to match a consistent profile where possible. Office workers use Windows 95 applications, periodically saving and allowing regular idle time. Notebooks are rotated among workers. We report the time elapsed when the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

tions without sacrificing legibility. If you work with spreadsheets, you'll appreciate the extra rows and columns you can view without scrolling. Even graphics professionals may find the 13.3-inch screen adequate when traveling.

In performance, the notebooks ranged from adequate to exceptional. On PC WorldBench tests, the NEC—the swiftest 13.3-inch-screen unit—equaled the performance of the fastest comparable desktop systems. The NEC also outran the fastest comparable 12.1-inch notebooks we've tested, by a slim margin.

LUGGABLE PCS?

BUT IF YOU plan to travel extensively with a notebook sporting a 13.3-inch screen, beware. They're slightly bulkier and significantly heavier than their 12.1-inch counterparts. Side by side, the raised lid of the NEC 6200MX stands about half an inch higher than the lid on its 12.1-inch sibling. Here's why this is a problem:

I was able to use the NEC 6200MX in a coach seat on a recent flight, but only by sliding it so close to me that nearly half the machine hung off the tray table. This neat trick worked only when the seat in front of me was upright. The minute its occupant tried to lean back, the notebook lid wedged into the back of her seat and prevented it from reclining. When I lowered the lid, her seat pushed it down so far, I couldn't see the screen. While this type of difficulty has also been reported with some 12.1-inch screens, the extra height aggravates the problem.

Lugging the NEC around the airport wasn't much fun either—it tips the scales at 9.4 pounds with AC adapter plus CD-ROM and floppy drives. But none of the big-screen notebooks we examined were lightweights.

These units also compromise on battery life. While the Toshiba ran for a respectable 4 hours and 28 minutes, the other notebooks failed to reach the 4-hour mark.

BIG SCREEN, BIG TICKET

AT THESE PRICES, a big-screen notebook is not for everyone. If you work primarily at two locations, you may want to consider buying two desktops and ferrying the data between them on removable media or transmitting them via a network or e-mail.

If you make multimedia presentations on the road or simply want the largest notebook screen available, you've plenty of options in the 13.3-inch class. You might want to check out the 13.3-inch screens on upcoming notebooks from Gateway 2000, Hitachi, IBM, and Micron, which should be shipping by the time you read this. These products are expected to offer additional features, such as a combination floppy/CD-ROM drive.

Then again, you could wait for the next generation of big-screen notebooks. By midsummer the first 14.2-inch models should also be shipping.

—*Yardena Arar* ▶

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NT Moves to Capture Publishing—but Falls Short in Key Areas

ANALYSIS

WHEN IT COMES to desktop publishing and media authoring—audio, video, and multimedia production—Apple's Macintosh blazed the trail. But judging by recent developments, Windows NT is clearly in hot pursuit.

Clearly, no one needs NT's industrial-strength features just for word processing and spreadsheet work, but have the recent market changes made NT a credible competitor in desktop publishing and media authoring? And if so, does that shift reflect a gradual transition to NT as a mainstream computing platform? We compared NT with the Macintosh operating system and Windows 95 to answer these questions.

NT GAINS MOMENTUM

PUBLISHERS AND multimedia developers demand speed and expandability. Historically, the Mac's PowerPC chips have been faster than Pentium chips at tasks such as image filtering and video compression. But new chips such as the Pentium II, AMD's K6, and Cyrix's 6x86MX have narrowed the gap. Publishing and multimedia applications also require lots of peripherals, including scanners, video digitizing cards, and assorted storage devices. Windows NT supports a much smaller range of hardware than do the Mac OS and Windows 95. NT also lacks Plug and Play features, making hardware configuration potentially cumbersome.

Intergraph Computer Systems' newest additions to its TD family of PCs, the 320, 325, and 425, address these issues. The PCs offer the performance of Pentium II- and Pentium Pro-based machines and come factory equipped with publishing essentials such as accelerated video circuitry, Ultra-Wide SCSI interfaces, and ethernet networking. By providing these goodies on the motherboard, such boxes may eliminate some equipment-configuration headaches. The products start at $3895 without monitor. Intergraph also offers a variety of NT machines designed for high-end video production and 3-D graphics rendering.

Another key factor is also contributing to NT's growing momentum: The major publishing and media-authoring applications are finally available for it. Within the past several months Adobe has shipped NT-compatible versions of its Illustrator drawing program, its After Effects video-effects package, and its Adobe Type Manager Deluxe utility, which enables NT to display smooth-edged fonts at any size. These programs join a list of shipping applications that includes Adobe PageMaker and Photoshop, Quark's QuarkXPress, and Macromedia's FreeHand.

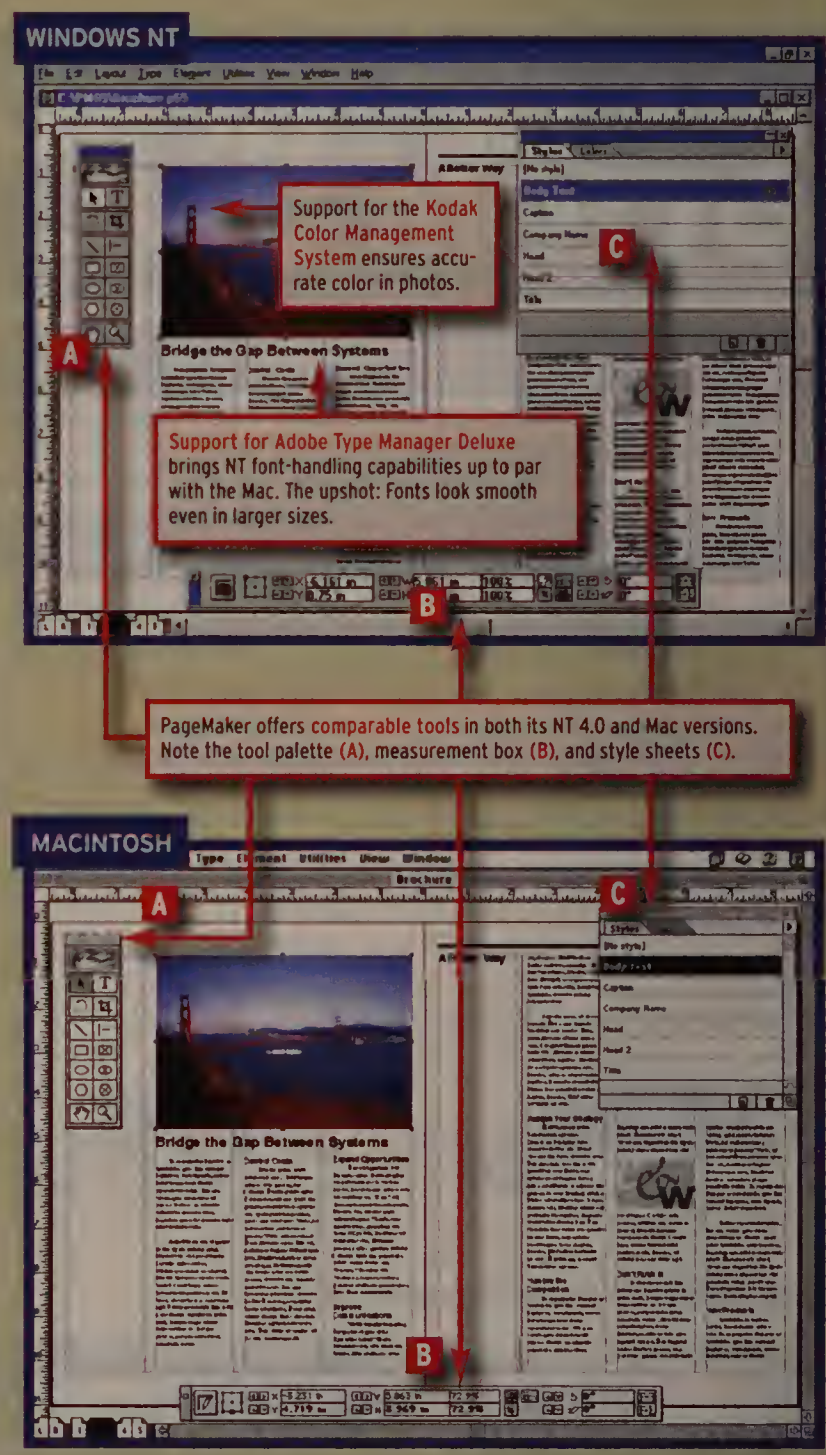
As video-production platforms, Windows 95 and NT are currently hamstrung by Microsoft's ActiveMovie and Video for Windows architectures, which lack the robustness that broadcast and corporate video producers demand. But that will change, too. This fall, Apple will ship QuickTime 3.0 for Windows, which is expected to provide the missing power.

IT STILL LAGS

THE BIG-TICKET applications may now be available, but publishers and media authors also rely on innumerable smaller utilities and plug-in modules. Similarly, audio and video producers rely on special-effects plug-ins and ▶

NT for Publishing: More, Better Apps

NT NOW ENJOYS wider software support. PageMaker 6.5 is the first version of Adobe's popular product designed to run on NT. Like many NT 4.0 apps, PageMaker supports the same file formats as its Mac counterpart and has similar features.



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compression utilities. By these yardsticks, Windows NT (and for that matter, 95) are trailing well behind the Mac OS. Such utilities are gradually migrating to the Windows world, but the selection remains sparse.

In publishing, of course, you need to print. That probably means printing to devices that use Adobe's PostScript page-description language, and here Windows is weak. A PostScript driver is available for NT and 95, but it isn't as mature as its Mac OS counterpart, and it doesn't support as broad a range of printers.

A related issue deals with obtaining high-resolution output from service bureaus, most of which were built around Macs. Many bureaus now accept Windows jobs, but these firms tend to be less experienced at troubleshooting Windows-related printing problems. Stepping in to take up the slack are large commercial printers, which historically have been Windows based and less biased toward Macs.

NT Advantages
- Fewer system crashes
- Smoother, more reliable multitasking
- Ability to hand off support headaches to IS

Mac Advantages
- Wealth of utilities and software add-ons
- Fewer configuration headaches
- Preferred by most service bureaus

NT: NOT THERE (YET)

DOES NT'S building momentum in publishing and media authoring suggest that it's becoming a mainstream operating system? Not quite. For average PC users who spend their time with office-productivity suites, NT's multiprocessing support and greater stability don't offset its technical complexity and lack of broad hardware support.

Windows NT is gaining ground in desktop publishing and media authoring, areas that the Macintosh has long dominated. Macs remain the best choice for high-end applications, such as glossy four-color magazines and catalogs.

In the end, Windows 95 and NT are making their strongest inroads in corporate publishing departments. Windows 95 now dominates in that arena, but look for Windows NT to come on strong over the next year as both hardware compatibility and software availability improve.

Further down the road, NT 5.0 and the successor to Windows 95, code-named Memphis, hold additional appeal. NT 5.0 and Memphis will share a common device driver architecture, which over time should increase the amount of NT-compatible hardware. Both new Windows versions will also support multiple monitors, a feature the Mac OS has long provided.

There's one more crucial issue to consider: Mac loyalty. The Macintosh dominates professional publishing as well as audio and video production. Any company hiring designers and producers to staff its media operation should be prepared for a crowd that strongly prefers the taste of Apples.

—Jim Heid

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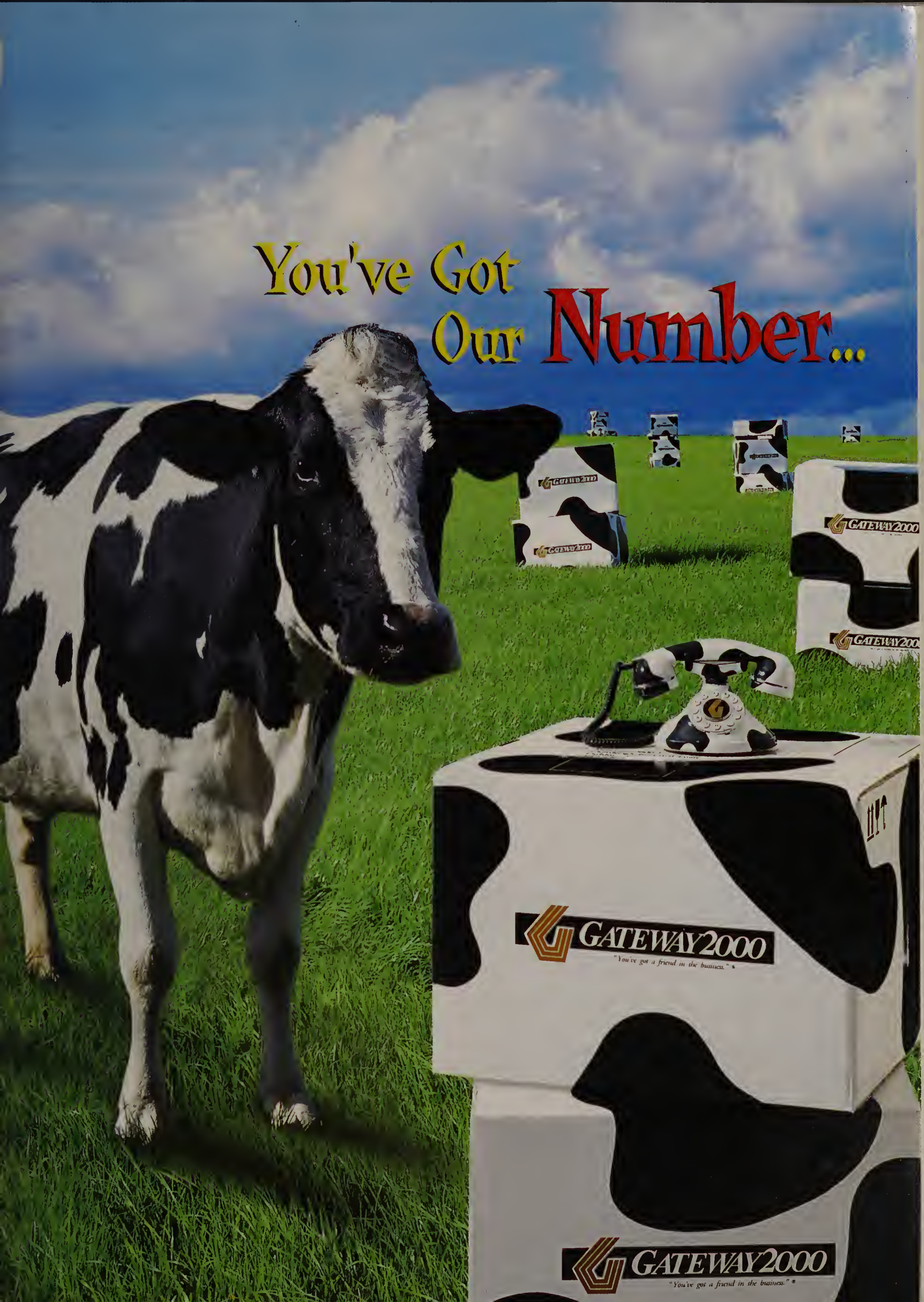
—Mindy Charski ■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- Wireless Field Mouse Remote
- MS Windows 95
- Destination Software Collection
- MMX Technology-Enhanced Software
- Gateway Gold Service & Support◆ for Big Screen PC/TVs

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D6-233

- Intel 233MHz Pentium II Processor with 512K Cache
- 32MB EDO DRAM
- Destination 31" VGA Monitor
- STB 2MB Graphics Accelerator w/ Cable-Ready TV Tuner
- 6.4GB 10ms EIDE Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Ensoniq Wavetable Audio
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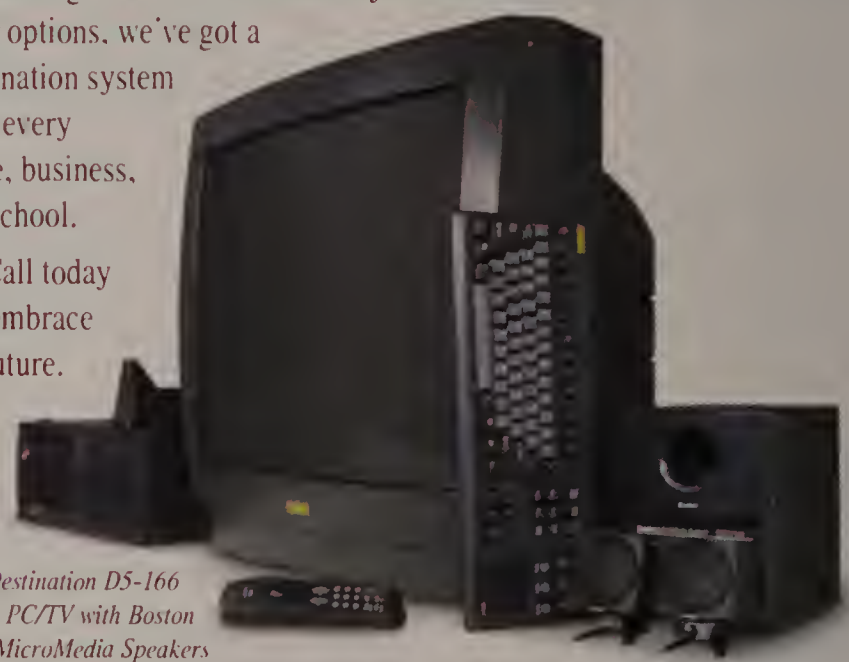

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- 16-Bit Gateway Audio
- Altec Lansing ACS-41 Speakers
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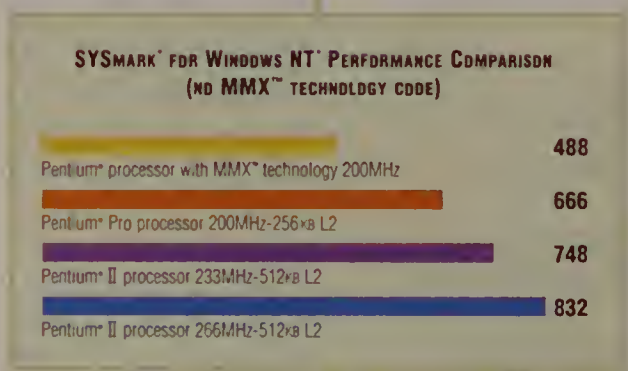
Welcome to chapter two.

The new Pentium® II processor. Read on.

When it comes to microprocessors, Intel wrote the book. That's why our new Pentium® II processor offers even more power than the Pentium® Pro processor and all the benefits of Intel MMX™ media enhancement technology.

Its sleek new package incorporates Intel's Dual Independent Bus architecture, an advanced design that uses two separate buses—one linked to the L2 cache and the other dedicated to the main memory. This allows the processor to access data from either of its buses simultaneously and in parallel rather than in a singular sequential manner. The result is faster information transfer and a boost in overall performance.†



The new Intel Pentium II processor. It's everything you need for your next chapter in desktop computing. To find out more, visit our Web site.

► www.intel.com/PentiumII

intel®
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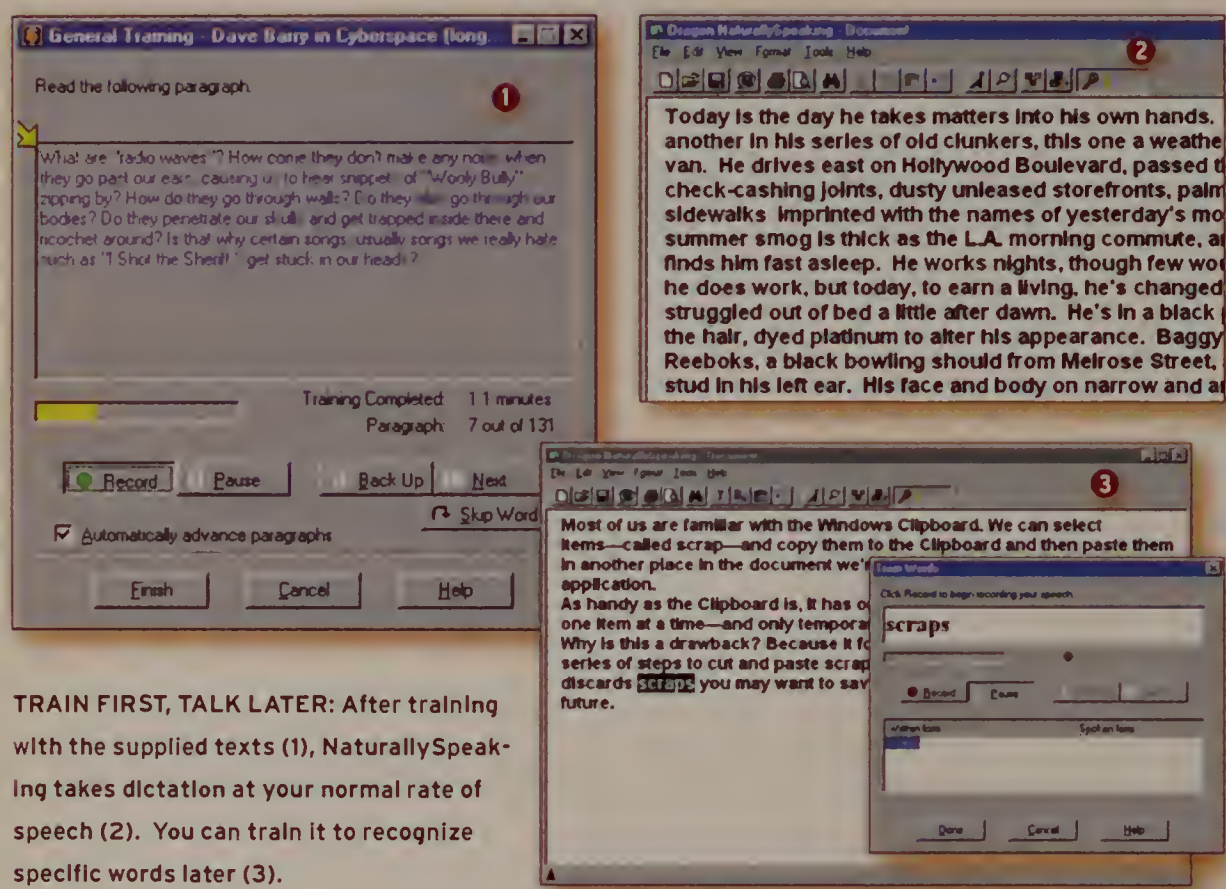
NEW PRODUCTS

NaturallySpeaking: Voice Recognition Breakthrough



TRAIN FIRST, TALK LATER: After training with the supplied texts (1), NaturallySpeaking takes dictation at your normal rate of speech (2). You can train it to recognize specific words later (3).

DICTATION

THE ABILITY TO comprehend language as it's normally spoken has long been the Holy Grail of speech-recognition software, not to mention one of technology's more elusive goals. Up until now, such products could capture only discrete speech—you had to pause between words—which in turn meant slow, tedious dictation.

Not any more. Dragon Systems' breakthrough product, NaturallySpeaking, lets you talk to your computer in so-called continuous speech, as you would converse with a fellow human being.

I was amazed when I tried the beta version of NaturallySpeaking. It recognized words as I spoke, at my pace—about 100 words per minute or better—whereas most discrete-speech products are limited to a recognition rate of 25 to 30 wpm. And the accuracy of the program was almost scary. It missed maybe two words per hundred.

NaturallySpeaking has some drawbacks. Setting it up takes more time than setting up a discrete-speech program because you have to train this product to recognize your voice patterns. This process takes about 20 minutes and consists of reading excerpts from Arthur C. Clarke's *3001: The Final Odyssey* or Dave Barry's *Barry in Cyberspace* (texts are included with the program). Although discrete-speech programs may work right out of the box, training may still be required if the software doesn't understand your accent.

Dragon says that NaturallySpeaking has been used successfully by people with different accents, but I found that it could do only so much with heavy regional speech patterns like my pronounced Boston accent. For example, the software kept interpreting the word *part* as *pot*, and even when I did train it to recognize *part*, it interpreted *pot* as *part*—perhaps because the words sound identical when I speak them.

NaturallySpeaking also requires a lot of horsepower: Your Windows 95 PC will need 32MB of RAM—48MB is recommended with Windows NT—plus 60MB of hard disk space and a Pentium-133 processor (although the program worked adequately on a Pentium-90 machine).

Unlike Dragon's discrete-speech products, which can be used with popular applications such as Microsoft Word, NaturallySpeaking runs in its own word processor that has more in common with Windows

NaturallySpeaking 1.0

PRO: Only dictation program that recognizes true continuous speech.

CON: Requires training, works only in its own word processor.

VALUE: Expensive, but priceless for dictation-oriented professionals or those who can't type.

Dragon Systems
800/825-5897
www.naturalspeech.com
Street price: $695

READER SERVICE NO. 747

Wordpad than Word. Two features that I sorely missed were the ability to create outlines and the word- and character-counting utility.

NaturallySpeaking's word processor does accept voice commands for all its functions; however, any documents you create have to be pasted in or exported to other Windows 95 applications.

Finally, there's the price. At $695, NaturallySpeaking isn't for technodabblers. But for dictation-oriented professionals such as doctors or lawyers, and those with repetitive strain injuries or other disabilities that make typing difficult or impossible, this application is a quantum leap forward over previous options.

—John P. Mello Jr.

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Xerox, Minolta Color Lasers: The Cheapest Yet

PRINTER

HAVING PROVED that color lasers can produce high-quality graphics on plain paper while printing fast enough for ordinary office use, printer vendors are now tackling the units' prices.

Xerox's new DocuPrint C55 should sell for about $3500; its upscale sibling, the DocuPrint C55mp with Adobe PostScript and ethernet, is expected to sell for $4500. Minolta's Color PageWorks, meanwhile, should check in at around $3000. All three printers are rated by the vendors at the same 600-dpi output and the same 3-ppm color and 12-ppm monochrome speeds as Lexmark's Optra C and Apple's Color LaserWriter, each of which at this writing goes for about $6000.

COLOR IT CHEAP: Xerox's DocuPrint C55 undercuts some competitors by $2500.

Both DocuPrint units include 30MB of memory and a 250-sheet paper tray. You also get a manual-feed tray, which is uncommon for a network printer: The driver lets you delay a manual-feed job while you stroll over, slip in your odd-format paper, and activate the job by giving a command on the control panel menu.

Xerox loaded the DocuPrint driver with other great features, too. It can convert color graphics to a monochrome format designed to fax well and can create proofs in black and blue to cut printing time. In informal tests of a shipping unit, the DocuPrint C55mp printed color at about the same speed as the Lexmark and Apple color lasers, but I was pleasantly surprised to see significantly faster text speed. I pulled great color and clean text from the C55mp and found its control panel very straightforward.

Graphics professionals will appreciate the DocuPrint's color-calibration schemes and halftone and overprinting controls. For network administrators, there's a built-in Web browser for remote configuration, including automatic downloading of new drivers from Xerox's Web site.

Both DocuPrint models have a relatively small footprint—18 inches wide, 16 inches deep, and 16 inches high—but weigh nearly 90 pounds. With their full complement of graphics and network features, either printer could satisfy all users in a typical workgroup or small office requiring lots of fast, high-quality color printing.

Minolta's printer didn't arrive in time for testing. However, its mere 4MB of memory may be a cause for concern. Minolta says that its imaging model reduces memory requirements but that adding memory improves image quality.

A 250-sheet paper tray and 150-sheet multipurpose tray come as standard equipment on the Color PageWorks; Adobe PostScript lists as an option for a very steep $749.

—Dan Littman ▶

Xerox DocuPrint C55, C55mp

PRO: Great quality, useful controls.

CON: None.

VALUE: Attractive for business users and graphics pros.

Xerox

800/349-3769

www.xerox.networkprinters.com

Street price: $3500 (C55), $4500 (C55mp)

READER SERVICE NO. 748

Minolta Color PageWorks

PRO: Excellent price, good paper-handling features.

CON: Short on memory, few special features.

VALUE: Too soon to say.

Minolta

888/264-6658

www.minoltaprinters.com

Street price: $2995, Adobe PostScript $749

READER SERVICE NO. 749

EDITED BY

Yardena Arar and Laurianne McLaughlin

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VeriTest Battery Life Results in Hours***

TravelMate 7000 (166MHz MMX)	7:26
IBM ThinkPad 760ED (133MHz)	2:38
Toshiba Tecra 720 CDT (133MHz)	2:38
Dell Latitude XPi (150MHz)	4:15
HP Omnibook 5500 CS (120MHz)	2:35

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*7-hour battery life based on VeriTest Cross Country test March 1997 running Windows 95. ***Full results available at www.veritest.com/tm7000xc.htm

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The PJ800 projects a sharp, crisp image even in well-lit rooms.

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3,000 hour, 260W DC Metal Halide Lamp
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ViewSonic®

Circle 246 on reader service card

Panasonic Flattens the CRT Curve

MONITOR

THE CRT UNIVERSE is no longer completely round. Built with Matsushita's new Pure Flat color display tube, Panasonic's 17-inch PanaFlat PF70 monitor is so flat that it initially looks almost concave.

What's so great about a flat-screen monitor? Most PC users aren't overly troubled by the bowing effect resulting from the convex shape of most display tubes. But anybody who works with graphics or precise design knows that even the best conventional monitors suffer from some distortion at the corners and edges, where the image contracts because of the tube's shape.

Flat-panel LCDs virtually eliminate the problem, but they're expensive—typically $2500 and up for a display comparable in size to the PanaFlat's 15.7-inch viewable area. At $829, the PanaFlat PF70 is one of the more expensive 17-inch CRT displays on the market; for example, it costs $131 more than the Iiyama Vision Master Pro 17, the reigning Best Buy on our 17-inch Monitors chart (see July Top 100). But the chart also has pricier models than the PanaFlat, and the monitor doesn't seem overpriced considering its almost distortion-free high-resolution (1600 by 1280, .24mm slot pitch) display.

PANASONIC'S FLAT-SCREEN monitor delivers crisp, nearly distortion-free images.

In informal tests, the PanaFlat PF70 displayed crisp, bright spreadsheets, text, and images; once you use it for a while, you won't even notice that slight concave effect. If you're in the market for a high-quality 17-inch monitor, you'll definitely want to consider this pioneering model.

—*Yardena Arar*

PanaFlat PF70

PRO: Flat CRT screen is nearly distortion free, excellent overall image quality.

CON: Expensive.

VALUE: Well worth a few extra bucks if you're a graphics pro.

Panasonic

800/342-8086

www.panasonic.com/alive

Street price: $829

READER SERVICE NO. 750

QUICK TAKES

Epson's Big Printer

Want to print large displays for presentations, for employee training sessions, or even to show off your work in the office lobby? Graphics professionals have used wide-format ink jets, which hold a broad range of paper sizes, for years. But with an estimated street price of $799, the Epson Stylus Color 1520 is the first one that's affordable enough for business use. This 1440-dpi printer handles precise jobs such as line drawings, maps, and design layouts, as well as general text and presentation materials. The input tray holds paper sized from 4 by 4 inches up to 17 by 22 inches. An optional attachment allows continuous printing of long banners. The 1520 isn't speedy: It's rated at up to 6 ppm for monochrome and 5 ppm for color, but expect considerably slower speeds for oversize prints with lots of color. Still, you'll value the 1520's paper-handling flexibility. Epson; 800/463-7766; www.epson.com.

—*Laurianne McLaughlin*

NEC Sets New Low Price for 12-ppm Lasers

PRINTER

NEC HAS SET a new price/performance standard with the SuperScript 1260. This 600-dots-per-inch laser outputs at up to 12 pages per minute and will sell for $799—or about $500 less than its main competitor, the 12-ppm, 600-dpi Hewlett-Packard LaserJet 5. (For $799, HP would sell you its 8-ppm LaserJet 6P.) NEC is giving you more printer for the money as it tries to move in on the market leader's turf.

Preliminary tests indicated that the SuperScript 1260's speed is on a par with other 12-ppm printers we've tested. The 1260 also comes with Adobe's PrintGear 1.1 technology, which radically reduces wait times when several documents are sent to a network printer. The included PrintGear software lets you print booklets, posters, and other complex jobs.

As for paper handling, the SuperScript 1260 comes with a 250-sheet paper tray and an 80-sheet multipurpose tray; another 500-sheet tray and a 50-envelope tray are optional. You can use the printer's manual-feed slot for envelopes, transparencies, and other kinds of special stock.

An optional $299 network interface card provides connection to TCP/IP, Novell NetWare 3.1*x* and 4.*x*, Windows NT, Windows 95, and EtherTalk networks.

Like many other printer makers, NEC now equips its networkable models with software that lets you use your Web browser to check on problems and otherwise administer the printer from remote locations. For a fast network laser printer, this is one of the best deals around.

—*Laurianne McLaughlin* ▶

NEC SuperScript 1260

PRO: Groundbreaking price, comes with Adobe PrintGear 1.1.

CON: None.

VALUE: Quite a deal.

NEC Technologies

800/632-4636

www.nec.com

Street price: $799

READER SERVICE NO. 752

6 ppm True 600 dpi Laser Printing

Print like the Fortune 500™ for under $300.

Why choose between advanced technology and affordability? Not just "laser quality," the new Mita DP-560 offers true 600 DPI B/W laser printing. It prints from any Windows® 3.1 or Windows® 95 application at up to 6 PPM and has a full 1 MB of memory. Best of all, the compact DP-560 is priced below $300,* so now even the smallest of small businesses can afford to look like the big guys.

mita can help

www.mita.com

* Expected selling price. ©1997 Mita Copystar America, Inc. Windows is a registered trademark of Microsoft Corporation. As an ENERGY STAR Partner, Mita Copystar America, Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

6 ppm True 600 dpi Laser Printing

After leading

the industry

in portables

for years, we've

set our sights

on something

bigger.

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intel inside PENTIUM® PRO PROCESSOR

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Circle 234 on reader service card

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- 2MB SGRAM video memory, expandable to 4MB
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- 4 external/2 internal drive bays
- 2 USB, 1 serial, 1 parallel ports
- Integrated Intel EtherExpress™ Pro/100B 10/100Mbps Ethernet®
- 200-watt power supply
- Sleep button with Instant On and Secure Sleep*
- Microsoft® Windows NT Workstation
- Intel LANDesk Client Manager
- DMI 2.0
- Security features: chassis intrusion alert and key lock port
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intel inside pentium PROCESSOR

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In Touch with Tomorrow

TOSHIBA

Circle 233 on reader service card

Instant All-in-One: HP LaserJet Companion

SCANNER

MULTIFUNCTION devices—machines that can print, scan, copy, and fax—are hot: Just about every major printer vendor now makes one. And no wonder. These so-called all-in-ones save money, cut down on desk clutter, and integrate office functions that would normally remain separate.

But if you already own a printer and fax-modem, you're probably not eager to drop another $500 to $1000 for a device that duplicates their functions. Now you don't have to: Hewlett-Packard's $249 LaserJet Companion connects to your PC and to a LaserJet 4 or 5 series, 6P, or the new 6L printer (see Top 10 Printers) and turns it into a combination fax machine and copier.

TWO BUTTONS are all the HP LaserJet Companion needs—one to scan in documents, the other to send them to your printer for copies.

Drop a document in the Companion's 300-dpi, 8-bit gray-scale scanner, push a button, and—voilà!—make a copy. Push another button, and the Companion scans the document, converts it to fax format, saves it on your hard drive, and instructs your fax-modem program to send it. You can put a stack of paper into the automatic document feeder, and you can scan anything up to 30 inches long. The Companion comes with Caere's OmniPage Lite OCR package and Visioneer's PaperPort software, which lets you label, annotate, and group scanned documents into archives like stacks of on-screen index cards.

Because of its circuitous approach to faxing (documents are scanned, saved to disk, converted to a fax format, and then sent by your fax software), I found the Companion less convenient for faxing than a self-contained multifunction device, which performs all of these tasks in one step.

Also, all-in-ones typically can do things that most fax-modem software can't, such as polling remote fax machines or password-protecting outgoing faxes. But at half the size and weight of a notebook PC, the Companion can travel with you, and it scans and faxes with no printer attached.

—Dan Littman

HP LaserJet Companion

PRO: Inexpensive, integrates well with printers.

CON: Inconvenient for faxing.

VALUE: Worth considering if you already have an HP LaserJet.

Hewlett-Packard

800/752-0900

www.hp.com

Street price: $249

READER SERVICE NO. 753

Matrox's Two-Card Video Studio

VIDEO CARD

ALTHOUGH ATI AND MIRO both boast of offering complete video editing packages, Matrox's $279 Rainbow Runner Studio is the only true all-in-one solution for your video needs. Whether you need videoconferencing or video editing, this device—along with a camera—can do it all.

I tried a preproduction model of the Rainbow Runner Studio with several peripherals (including a VCR, camcorder, and TV set) and used the bundled Ulead iPhoto Express software to grab and edit screens without a hitch. Setting it up was the most difficult part, especially considering that it is a daughtercard to the separately sold $159 Matrox Mystique graphics card, which must be installed first. But step-by-step instructions and diagrams made things a bit easier.

Video from the VCR and camcorder can be edited using a straightforward cut-and-paste interface, making it easy to create storyboards and compile video, sound, titles, and special effects. Hook the Rainbow Runner Studio up to the TV, and you can program your PC to scan for keywords in closed-captioned text. When a match is found, the TV video window pops open, letting you watch the results of your search while working in another application.

I then easily reversed the input to output so the TV would display what was on our computer, be it a video game or a presentation. The card also comes bundled with VDOnet's VDOPhone software for inexpensive, if mediocre, videoconferencing over the Internet.

The Rainbow Runner Studio is an excellent, inexpensive tool for training videos, presentations, and no-frills videoconferencing. No other card matches its versatility.

—Shane Mooney ▶

Matrox Rainbow Runner Studio

PRO: Caters to all video needs.

CON: Complicated setup, Matrox Mystique card required.

VALUE: Great for businesses and hobbyists alike.

Matrox

800/361-1408

www.matrox.com

Street price: $279 (plus $159 for Matrox Mystique card)

READER SERVICE NO. 754

It's a No Brainer.

A. It's as fast as they come, and then some.

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E. It's been commended and recommended by all the trade books.

F. It has a loyal following that swear by it - not at it.

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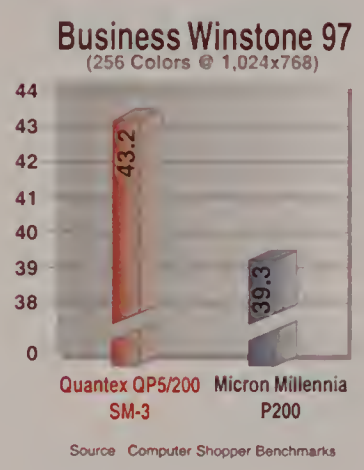

B.

Cutting-Edge Technology

If it's the newest, the fastest, or the most innovative development, you can bet Quantex will be one

- ☑ **Pentium® II Processor**
- ☑ **K56 Flex Modem**
- ☑ **DVD**

of the first to have it. We pride ourselves on being a leader, not a follower. Being among the first to incorporate the Pentium® II processor, K56flex modems and DVD into our systems are just a few examples of this forward thinking.

C.

Brand-Name Components

Look inside any Quantex PC and you'll see lots of names you recognize. That's because we only use components made by the undisputed leaders in the PC industry. The best of the best! Why are we so fussy? Simple. At Quantex, we know a PC is only as good as the sum of its parts.

Windows Magazine, 6/97

"Peek inside the QP5/200 SM-2's mini-tower case and you will find (it) filled with wall-to-wall name-brand peripherals."

D.

Living, Breathing 24-hour support

We provide expert technical support 24 hours a day, 7-days a week. Talk to real-live people who will solve your problem - not a frustrating know-nothing recording. On top of that, over 95% of incoming calls are answered in less than three minutes

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PC World, 5/97

"Quantex provides important bene fits like (all)-weekend support"

as A, B, C, D, E, F, G.

E.

Highly Acclaimed

Read any good PC trade magazines lately? Well, if you have, you can't

help but notice the way Quantex keeps getting great reviews on its systems and lots of "thumbs up" from the trade press. Quantex has received over 10 PC World Best Buy awards and has been on PC World's Top 20 list over 61 times in the past 12 months. But don't think we're sitting on our laurels. These awards only spur us on to earn even more!

F.

Loyal Following

If you really want to know how good a Quantex PC is, check out the number of buyers who come back to buy from us a second time. And a third time. No one has a more loyal following than Quantex. For the past decade, we've sold hundreds of thousands of PC's into homes and businesses and the vast majority of customers have expressed their total satisfaction in the best way possible. By coming back for more.

PC World, 6/97

In a recent PC Reliability and Service report, over 80% of respondents who own Quantex systems would buy from Quantex again.

G.

And Here's the Kicker. It Costs Less!

Quantex is, hands down, the undisputed leader in offering the most for the least. See for yourself.....

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- 17" Digital Monitor (16.1" viewable)
- K56flex™ protocol Fax/Modem w/Voice Mail and Speakerphone
- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
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- ATX Case
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The Pentium® II processor Delivers a Performance Punch

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MMX™ intel inside pentium® II PROCESSOR

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- Special DVD Upgrade ..... See Below
- Panasonic PD/CD-Rom Drive w/ one 650MB PD cartridge.. $279
- Three(3) Panasonic PD cartridges $99
- APC Back UPS Office (price reflects $30 manuf. rebate)... $169
- 3Com 3c905 PCI NIC $89
- Motorola ISDN Terminal Adapter $189
- Microsoft Natural Keyboard (upgrade from 104-keyboard) .. $39
- Microsoft Sidewinder 3D Pro Joystick $59
- HP Deskjet 692C Printer (w/ photo color kit) $299
- HP Laserjet 5L-FS Printer $399

(all upgrades are covered by manufacturer's warranty)

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Utilizing the most widely-accepted standard, K56flex™ adopted by over 400 leading high-tech companies, your days of patiently waiting for files to download are over. K56flex technology was specifically created to allow you to download as much information as quickly as possible.

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Say goodbye to IRQ and COM port conflicts when adding hardware. Most Quantex systems now come standard with two Universal Serial Bus ports so you can take advantage of the newest USB peripherals like digital cameras, joysticks and more.

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Your system purchase:	SM-1 or SM-2	SM-3 or SM-4
DVD Upgrade Package Cost:	$599	$569

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Power Multimedia Series

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- 15" Digital Monitor (14.0" viewable)
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- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec Lansing ACS-90 Speakers
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QP6/233 SM-1x (with Pentium® II Processor).... $2149
QP6/266 SM-1x (with Pentium® II Processor).... $2299

QP5/233 SM-2 (with MMX™ Technology) $2149

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- Matrox Millennium 3D w/4MB WRAM
- 17" Digital Monitor (16.1" viewable)
- K56flex™ protocol Fax/Modem w/Voice Mail and Speakerphone
- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec Lansing ACS-90 Speakers
- Mid-Tower Case
- 104-Key Keyboard With MS IntelliMouse
- MS Windows '95 With MS Plus

NEW! ▶ MS Office 97 Small Business Edition

- 3-year limited warranty, 24-hr./7-day Technical Support

QP6/200 SM-2 (with Pentium® Pro Processor*) $2299
QP6/233 SM-2x (featuring Pentium® II Processor)... $2399
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Best Value!

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- Matrox Millennium 3D w/4MB WRAM
- 17" Digital Monitor (16.1" viewable)
- K56flex protocol Fax/Modem w/Voice Mail and Speakerphone
- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec Lansing ACS-45 Speakers w/subwoofer
- ATX Case
- 104-Key Keyboard With MS IntelliMouse
- MS Windows '95 With MS Plus

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QP5/233 SM-3 (with MMX™ Technology).... $2299
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QP5/166 WS-1

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- 15" Digital Monitor (14.0" viewable)
- 3Com 3c509 ISA Combo NIC
- Toshiba 16X Max 95ms EIDE CD-ROM Drive
- Mini-Tower Case
- 104-Key Keyboard With MS PS/2 Mouse
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QP5/166 WS-1.....$1249
(with MMX Technology)

QP5/200 WS-1.....$1349
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QP6/266 WS-4x

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- Adaptec 2940UW PCI Ultra Wide SCSI Controller
- Matrox Millennium 3D w/4MB WRAM
- 17" Digital Monitor (16.1" viewable)
- 3Com 3C905 PCI 10/100 NIC
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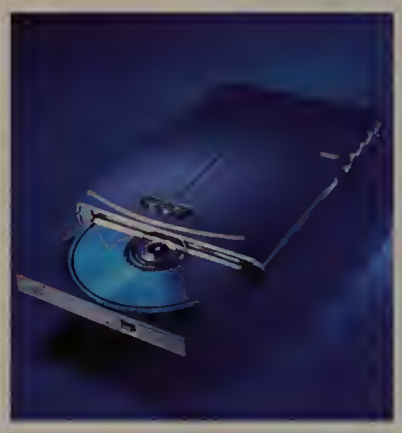
Canada 1-800-793-4167
Puerto Rico 1-800-793-4185

Backpack Bantam: CD-ROM to Go

C D - R O M

PORTABLE CD-ROM drives are getting smaller, lighter, faster, and cheaper. Micro Solutions' Backpack Bantam sets a new standard in the smaller-and-lighter department, while matching bulkier competitors in cost and speed.

Weighing 1.5 pounds and measuring 1 by 8 by 6 inches, this $299 parallel port–based 8X drive is by far the skinniest portable CD-ROM drive on the market and among the lightest, with or without the built-in sound option, which costs an extra $50. (You can still hook up a printer by using a pass-through parallel port on the Backpack Bantam.) I installed a preproduction unit in minutes, and it worked perfectly for installing software and playing audio CDs. However, the half-dozen multimedia titles I tried running on my Pentium-90 notebook were marred by patchy audio, possibly because the notebook didn't have the recommended Enhanced Parallel Port.



SLIM CD-ROM DRIVE: New portable weighs only 1.5 pounds.

Other caveats: The parallel port connection effectively limits the drive's performance to 4X-to-6X. Also, there's no battery pack, and the built-in speakers provide so-so sound.

The Backpack Bantam won't turn your aging notebook into a high-performance multimedia machine. But if you don't have $2000 for a notebook with its own CD-ROM drive, the Bantam is worth a look.

—Yardena Arar

Backpack Bantam

PRO: Ultralightweight, slim, and portable; easy to install.

CON: Parallel port hookup limits speed, multimedia can be patchy.

VALUE: Good for routine CD-ROM tasks on the road.

Micro Solutions
800/890-7227
www.micro-solutions.com
Street price: $299, sound option $50

READER SERVICE NO. 755

QUICK TAKES

Quantum's Big Hard Drive

When shopping for a hard drive, some people look for the most storage at the best price. But if you also consider data transfer speeds and mean-time-between-failure rates, Quantum's 6.4GB Fireball ST emerges as a hot new commodity—even at its high-end $525 street price. Quantum's new Ultra DMA/33 protocol allows data transfers at up to 33MB per second with an IDE card that supports it. (The SCSI version supports rates of up to 40MBps with the Ultra SCSI-3 spec.) The Fireball is rated to run for 400,000 hours without a failure and is also available in smaller capacities: 4.3GB and 3.2GB (IDE and SCSI), 2.1GB (SCSI only), and 1.6GB (IDE only). Quantum; 800/826-8022; www.quantum.com.

READER SERVICE NO. 756

—Joe Gomolsky

Compaq-RCA's Couch Potato Dream Machine

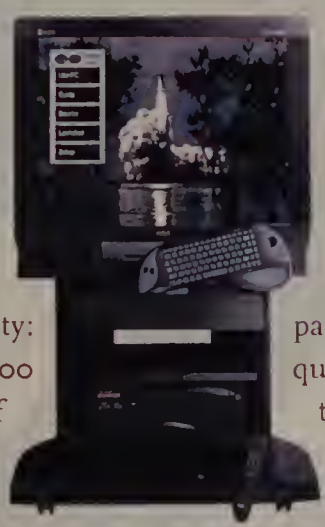
C O N V E R G E N C E

YOU'D LIKE TO watch a movie and then play that PC game. Or you need a big screen for boardroom presentations. You'll want to take a look at the PC Theatre 9000 CPU, a PC and TV combo with a massive 36-inch screen.

This joint production of Compaq and RCA is big, black, and sleek. It follows in the footsteps of Gateway 2000's 31-inch Destination (see "The Internet Meets the Couch Potato," *@Home*, October 1996), but with some significant differences.

Unlike the Destination, which boots like a computer, the PC Theatre switches on in TV mode; an on-screen menu lets you switch to a Windows 95 desktop, a game, the Web, or a TV program guide. It has an infrared wireless keyboard, a universal remote control, and a game pad.

The PC Theatre's hardware is meaty: a Pentium MMX-200 processor, 40MB of EDO RAM, a 3.8-GB hard disk, a 16X CD-ROM drive, and a 33.6-kbps fax-modem. You also get two cable-ready 181-channel tuners, as well as picture-in-picture capability so you can view two channels at once. The sound is excellent, the video sharp and clear. But at the device's 720 by 480 resolution, the desktop icons look blurry.



CONVERGENCE COSTS: PC Theatre runs nearly $5000.

The similarly configured Destination has comparable audio-visual quality, but its desktop is a bit crisper. Surround Sound is built into the PC Theatre; the basic Destination comes with stereo speakers and subwoofer (a seven-piece Dolby Pro Logic upgrade costs $599).

The PC Theatre 9000 CPU is targeted to consumers who want high-end home entertainment—and at $4999, high-end is what you get. If a 31-inch screen will do, buy the $3199 Destination. But for the convenient interface and the biggest, baddest display available, the PC Theatre may well be worth the extra money.

—Aoife McEvoy ▶

PC Theatre 9000 CPU

PRO: 36-inch screen.

CON: Expensive; desktop icons are blurry at 720 by 480 resolution.

VALUE: You pay for the biggest PC-TV screen available.

Compaq and RCA
800/345-1518
www.compaq.com
List price: $4999

READER SERVICE NO. 757

Psion Series 5: Notebook Power, PDA Size

PALM-TOP

APPEARANCE *can* be deceiving. Psion's next-generation personal digital assistant, the 32-bit Series 5, is a light and debonair Fred Astaire on the outside, a muscular and multifaceted Arnold Schwarzenegger inside. This 6.75-by-3.56-inch, 12.5-ounce pocket PC is less than an inch thick, but its versatility and power all but burst out of the sleek case.

I examined a preproduction unit. Like all palmtops, the Series 5 has a clamshell design, but the 640-by-240-pixel VGA screen embedded in the lid is great for viewing full page widths. The keyboard tray slides forward when the lid is opened, creating space for keys wide enough for touch typing—a palmtop first.

WATCH OUT, WINDOWS CE: Psion's Series 5 boasts extrawide keys, a touch screen, and 13 applications.

Up to now, Psion devices accepted only keyboard input. The Series 5 adds a well-proportioned stylus for its highly legible touch-screen display. Applications and customization tools are activated by a light finger tap.

The device ships with 13 functions that mirror closely the look, feel, and use of popular Windows 95 apps. A digital sound recorder works even when the unit is closed.

File transfers are accomplished through serial cable or IrDA-compliant infrared. Even with frequent use of backlighting, the unit's two AA batteries will last 35 hours.

The Series 5's predecessor —the Series 3c—was a *PC World* Best Buy in May (see "Put a PC in Your Pocket"). With the Series 5, Psion has upped the ante for PDA power and convenience.

—*Michael S. Lasky*

Psion Series 5

PRO: Powerful multitasking PDA.

CON: Digital voice recorder eats up memory and power quickly.

VALUE: Gee-whiz power and style make this the PDA to beat.

Psion, Inc.
800/997-7466
www.psion.com
List price: $599 for 4MB, $699 for 8MB

READER SERVICE NO. 758

QUICK TAKES

PDA Sync Solution

One problem with most palmtop computers is their inability to synchronize with the multitude of personal information management applications. Puma Technology's IntelliSync can scratch that itch. Available in separate versions for Windows CE handheld PCs, PalmPilots, and Psion Series 5 palmtops, IntelliSync transfers scheduling, to-do lists, and contact data from PC apps such as Outlook, Schedule+, Lotus Organizer, GoldMine, Sidekick, and many others—in either direction. If you use separate applications to track contacts and make appointments, IntelliSync's mix-and-match setup will enable you to pick the particular application for each function. IntelliSync is list-priced at $69.95; frequent upgrades are available to users who pay a one-time additional fee of $39 at the time of registration. Puma Technology; 800/774-7862; www.pumatech.com.

READER SERVICE NO. 759

—*Michael S. Lasky*

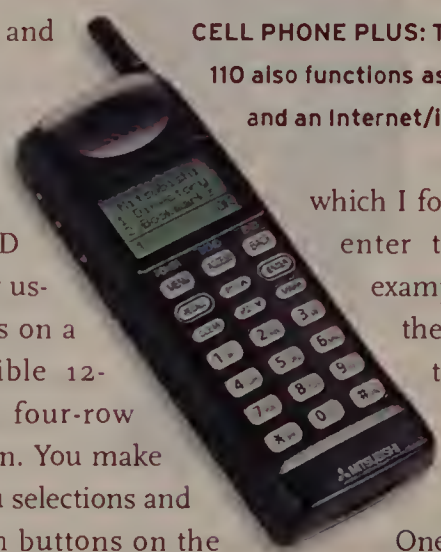
Mitsubishi's Versatile Mobile Phone

MOBILE PHONE

MITSUBISHI'S $500 MobileAccess 110 looks like a cellular phone and acts like a cellular phone, but it's really a multifunction communicator on the go. That's because this robust 9.6-ounce device also packs a wireless cellular digital packet data modem and a 19.2-kbps fax-modem.

CDPD capability gives you Internet and intranet access, two-way messaging (good-bye, pager), wireless e-mail, and online services such as stock quotes, airline and movie schedules, and news.

You can access all the phone and CDPD services by using menus on a quite legible 12-character, four-row LCD screen. You make your menu selections and scroll with buttons on the keypad. But to enter text, you have to keep pressing the 12-key phone pad until the right letter appears on screen, which I found annoying. To enter the letter *S*, for example, I had to press the 7 key four times to get past *P-Q-R*.



CELL PHONE PLUS: The MobileAccess 110 also functions as a two-way pager and an Internet/intranet device.

In addition, CDPD can be expensive to use: One such service plan, AT&T PocketNet, costs $40 per month on top of regular cellular phone fees.

I wouldn't (and probably couldn't) use the MobileAccess 110 to read long messages. But for short communiqués that you can answer instantly by voice or e-mail, this is a wireless wonder.

—*Michael S. Lasky* ▶

MobileAccess 110

PRO: Cellular phone, e-mail, Internet, and fax in a compact package.

CON: Inconvenient text entry.

VALUE: Flawless performance and versatility are worth the price.

Mitsubishi Wireless Communications Inc.
408/730-5900
www.mobileaccessphone.com
List price: $499.95

READER SERVICE NO. 760

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Hitachi's Capable but Costly MPEG Camera

DIGITAL CAMERA

UNTIL NOW IT took a video camera, a video capture board, and the right software to create digital video for presentations, multimedia, Web pages, and video catalogs. But Hitachi's breakthrough MPEG1A MPEG camera records full-motion video with sound and transfers the digitized data to your PC via a bundled ISA card interface kit—no additional equipment is required.

HITACHI'S MPEG camera records video, stills, and audio.

If you need fast digital videos, the MPEG1A is worth its hefty $2500 price tag.

The MPEG1A records up to 20 minutes of video—in real-time MPEG compression—at 352-by-240-pixel resolution; up to 3000 JPEG-format stills at 704 by 480; or as many as 1000 photos with 10 seconds of audio annotation apiece. Other features include a 1.8-inch LCD screen, an f2.4–3.5 6X zoom lens, a 260MB PC Card for data storage, two rechargeable batteries (each good for about 40 minutes), and a wireless remote control.

The MPEG1A requires a PC with at least a Pentium-100 processor, 16MB of RAM, and 80MB of hard disk space. You can connect the camera to a television set or a VCR for viewing or recording.

The prerelease unit I tested produced generally good-looking videos and stills nearly as nice as those created with the $599 Olympus D-200L and $399 Epson PhotoPC, the Best Buys in our March digital camera roundup. But in low-light conditions or when shooting rapid scene changes or fast-moving subjects, the results can be blurry or indistinct—a common problem when MPEG compression is performed on the fly.

If higher quality or resolution is more important to you than fast and easy video production, you're better off sticking with traditional film or videotape equipment.

—*Richard Jantz*

Hitachi MPEG1A

PRO: Records both video and audio, has LCD screen and 6X zoom lens.

CON: Expensive, video limited to 20 minutes, quality not outstanding.

VALUE: Usability and fast performance balance sticker shock.

Hitachi Home Electronics (America), Inc.

800/448-2244

www.mpegcam.net

Street price: $2500

READER SERVICE NO. 761

QUICK TAKES

Cirque's Cool Cat

You've tried a mouse, a trackball, and even that newfangled foot mouse—and you're *still* not comfortable with your pointing device? You might want to consider Cirque's Power Cat touchpad. Besides such useful features as horizontal and vertical scroll controls, Internet navigation buttons ("back" and "forward"), a zoom command, and enhanced sensitivity, the Power Cat comes with a pen and a signature-capture program, all for $79. Since it plugs into a spare serial or PS/2 port, mouse lovers can use the Power Cat in conjunction with a mouse. Cirque Corp.; 888/454-3373; www.glidepoint.com.

READER SERVICE NO. 762

—*Amy Ng*

Kodak's First USB Video Camera

DIGITAL CAMERA

KODAK'S NEW DVC 300 Digital Video Camera is one of the best videoconferencing cameras I've seen, but you'll need a PC with a Universal Serial Bus port to use it. The advantages of using a USB-based peripheral include plug-and-play installation, faster data transfer than that available with serial or parallel ports, and the ability to daisy-chain multiple devices to a single USB port. Best of all, the $199 DVC 300 is one of the cheapest video cameras on the market, making it a bargain for both office and home use.

A shipping version of the DVC 300 was a breeze to set up: Just install the software and plug the camera's tethered cable into an empty USB port—no boards, batteries, or power adapter. The camera comes with several easy-to-use applications for videoconferencing and editing.

The DVC 300's automatic controls for image brightness and color work well, as do several manual controls. There's no direct shutter-speed control—useful for low light and other conditions—but you can compensate by using other options for zooming and sharpness. The DVC 300 displays video images at up to 320 by 240 resolution and stills at up to 640 by 480.

In side-by-side comparisons with the comparably priced, parallel port–based Compro Digital Color Internet Camera (see *New Products*, November 1996), the DVC 300 provided better-looking video images.

Besides a Pentium PC with a USB port, you'll need Windows 95 version 4.00.950B or later and a microphone. The DVC 300 is a good choice for live video applications—and isn't bad for still shots.

—*Richard Jantz* ▶

Kodak DVC 300 Digital Video Camera

PRO: Low price, easy USB interface, good software bundle.

CON: No direct shutter-speed control.

VALUE: Great videoconferencing tool for USB-equipped PCs.

Eastman Kodak Co.

800/235-6325

www.kodak.com/go/dvc

Street price: $199

READER SERVICE NO. 763

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A Swarm of Speedy CD-ROM Drives

CD-ROM DRIVES

FROM THE "if it's faster, it must be better" school of PC peripheral marketing come the latest 20X and 24X CD-ROM drives. But hold your applause, because there's plenty of fine print.

First, "24X" does not mean a constant speed in the same way that 2X, 4X, and 8X did in their day. On average, 24X performance is more like 14X, for several reasons. Although the older drives transferred data at constant rates, the new ones perform within a range that depends on the data's location on the CD. Data on inner tracks is transferred more slowly than data on outer tracks: The 24X drives typically transfer at about 10X on the inside track and reach 24X only on the last, outermost track. Since few CDs are filled to the brim, and since recording starts on the inner track, not many discs exploit the higher speeds possible with such fast drives. On top of this, my tests indicate that the 24X drives have trouble reading outer tracks on some discs, slowing overall transfer rates to as low as 8X.

Another problem is that 24X drives outpace the BIOS on many PCs, including some older Pentium machines. If you want to upgrade to a 24X drive, you'll need to ask your system vendor whether the PC's BIOS supports Mode 4. Otherwise, your new 24X drive won't run any faster than a 10X to 13X unit.

I tested identical IDE 10X/24X drives from ACS Innovations and Panasonic (both made by Matsushita); a Plextor 12X/20X SCSI drive; and Toshiba's 12X/24X IDE drive. (I also tested a Hitachi IDE unit that won't be sold at retail but will be widely available in new systems and third-party upgrade kits.) All the IDE models have minimal front-panel features, and—with minor variations—all perform similarly. They have quick access times of about 90 milliseconds, and they load large files almost as quickly as a hard drive would. Among the IDE drives, the Toshiba unit delivers slightly superior multimedia, while the Hitachi was the least consistent performer in our tests.

THE PLEXTOR 12/20PLEX CD-ROM DRIVE, a SCSI-based model, handles multimedia better than IDE competition such as the Compro or Panasonic units.

But none of the IDE models handles full-screen video very well. The reason? IDE drives require considerable processing power, and this demand leaves fewer resources available for CPU-intensive multimedia applications.

In contrast, SCSI drives deal much better with multimedia, which is why I prefer the Plextor unit. Its minimum transfer rate is 12X and it tops out at 20X, but it reaches that 20X rate less than a third of the way through a disc and maintains it, for an average of about 16.5X. (The Toshiba, an IDE drive, offered similar speed.)

In addition, the Plextor had no problems reading outer tracks, and because it's a SCSI device, you'll avoid the BIOS hassles.

The Plextor's video performance is flawless, its front panel has some extra features, and it's reasonably priced. Plus, the "12/20" in the product name is a fine example of truth in advertising.

—Jeff Sengstack ▶

Compro LMD-585

PRO: Solid performer, widely available, comes in both external and internal models.

CON: IDE hampers multimedia performance.

VALUE: A bargain.

ACS Innovations Int'l
888/226-6776
www.acscompro.com
Street price: $149 internal, $219 external

READER SERVICE NO. 764

Panasonic LK-MC686BP IDE/ATAPI

PRO: Another good performer, widely available.

CON: More expensive than comparable unit from Compro, IDE hampers multimedia performance.

VALUE: Buy the Compro.

Panasonic Communications & Systems
800/742-8086
www.panasonic.com/alive
Street price: $199 (internal only)

READER SERVICE NO. 765

Plextor 12/20PleX

PRO: Excellent, consistent performance; extra front-panel goodies; nice documentation.

CON: Tops out at 20X, higher priced, SCSI card required.

VALUE: Worth a few extra dollars.

Plextor Corp.
800/886-3935
www.plextor.com
Street price: $245 internal, $339 external

READER SERVICE NO. 766

Toshiba XM-6102 24X Max

PRO: Best multimedia performance among IDE drives.

CON: Difficult to find in stores.

VALUE: Reasonably priced considering its performance.

Toshiba America Information Systems, Inc.
714/457-0777
www.toshiba.com
Street price: $175 (does not include cable or software)

READER SERVICE NO. 767

The HP 300 Series Palmtop PC
Featuring the widest screen so you can view information like you would on your desktop PC
VGA wide screen: 640 x 240 pixels
Direct print capabilities through an infrared connection
Wireless e-mail and Internet access via Type II PC Card Modem*
Fast and easy synchronization with your desktop PC
From $499†

The problem with most handheld PCs is that the screen isn't wide enou

To get the whole picture, see our quick link: www.hpresource.com/palmtop-3

*Optional accessory available at additional price. †Projected U.S. street price. Microsoft and Windows CE are U.S. registered trademarks of Microsoft Corporation. ©1997 Hewlett-Packard Company PPG450

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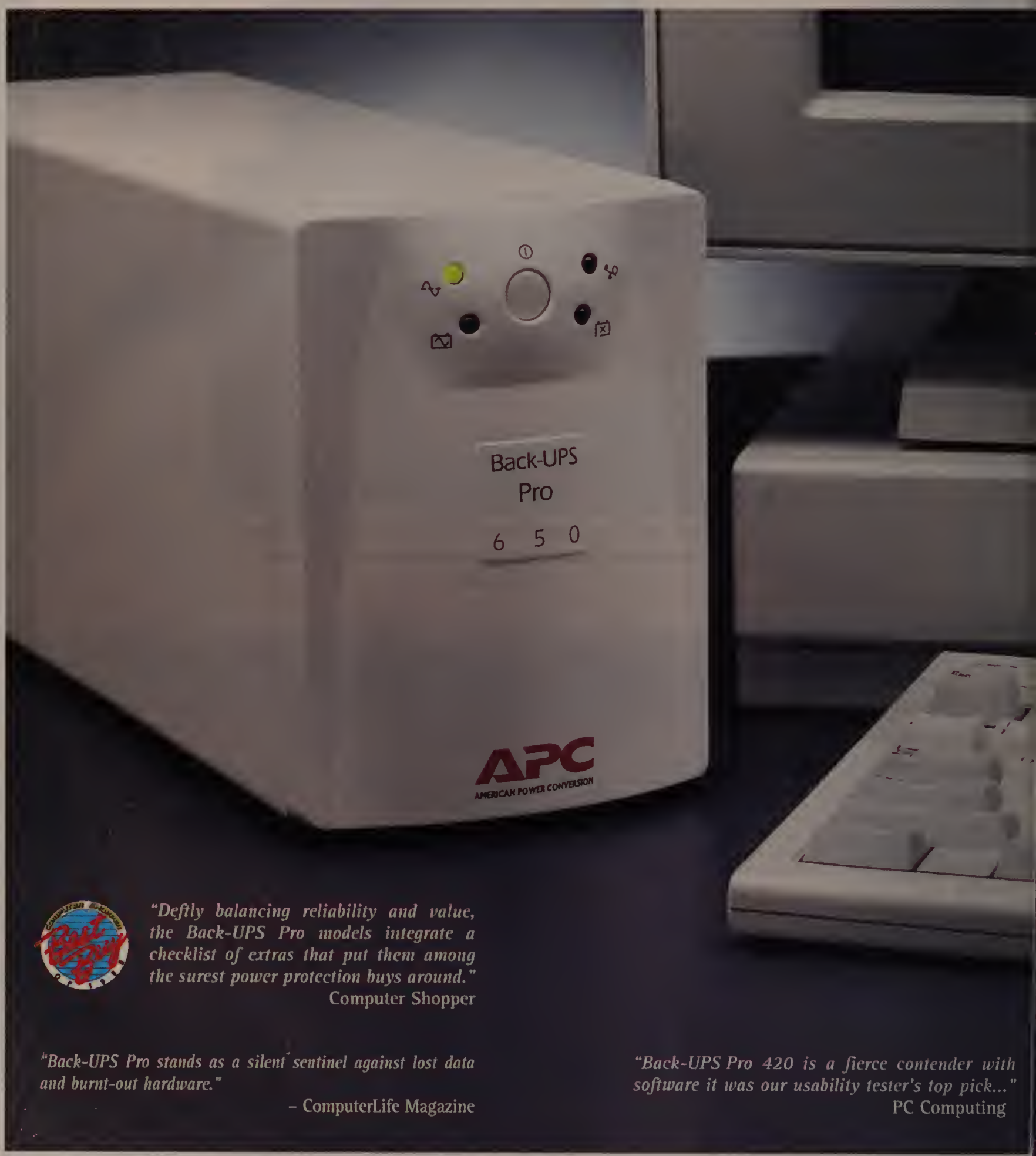
Windows NT Workstation 4.0
on a PC. APC's Back-UPS Pro®



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Computer Shopper

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PC Computing

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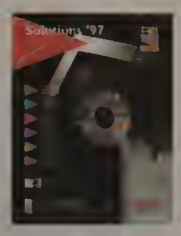

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MICROSOFT. WINDOWS NT. COMPATIBLE

If you're about to invest, or have already invested in the power of a multi-tasking operating system like Windows NT Workstation 4.0, experts say it's also time to invest in APC protection. Why? Even though Windows NT Workstation 4.0 enhances ease of use and reliability, you still can't control bad power, which is still the largest single cause of data loss. Windows NT provides your organization with a lower cost of ownership relative to Windows 3.1 environments. With the affordable protection that APC offers, that lower cost of ownership is safeguarded. It doesn't make sense to leave your Windows NT Workstation machine unprotected.

Unmatched Protection

Like Windows NT Workstation, Back-UPS Pro provides high performance, and industrial-strength reliability. The inevitable power problems that threaten your computer are no match for the premium power protection provided by Back-UPS Pro.

- Automatic Voltage Regulation (AVR) provides complete protection against extended brownouts or overvoltages, without battery drain.
- CellGuard™ intelligent battery management extends battery life and provides deep discharge protection with fast recharge, so Back-UPS Pro is always ready for the worst outages.

Windows NT Workstation enables Internet access with the latest and most exciting browsers through all the standard TCP/IP components. Back-UPS Pro includes protection for that internet connection with built-in 10Base-T network cable or RJ11 phone line surge protection. This ensures power problems don't find your computer through the use of your modem or network interface card. Back-UPS Pro is also backed by a $25,000 guarantee that your connected equipment will not be damaged by a surge, even lightning (see policy for details).

PowerChute Pro: WorkSafe™

Windows NT Workstation provides stability and security through a number of features. Back-UPS Pro enhances that stability and security, even during a power failure. Back-UPS Pro includes PowerChute Pro power management and data saving software - FREE.

While Windows NT provides native automatic shutdown, it will not save any work in progress. PowerChute Pro's WorkSafe™ feature protects and saves open files, then safely closes Microsoft Office applications. When the power goes out, PowerChute Pro automatically activates WorkSafe, even if you're not there. In fact, PowerChute Pro can automatically power on and power off your computer, helping to conserve electricity.

If you compute with Windows NT Workstation 4.0, and want to ensure the highest levels of performance and reliability, protect your desktop PC with the UPS that protects more PCs than all others combined: APC.

Computer Shopper's readers know that their "...PC's best possible friend is an uninterruptible power supply (UPS)." They gave the Best Buy award to APC's Back-UPS Pro series. No wonder 8,000,000 users worldwide agree that APC provides the world's most reliable power protection.

Michael Mullicane, CIO for America II Group, the 17th fastest growing company in America according to Inc.'s 1994 list says, "It's a no-brainer to protect servers, but we learned that it was crazy to bog down our MIS staff with client-related downtime and data loss when an APC UPS is such a cost-effective solution. Now we properly protect every single workstation in our entire global network... At the bottom line, having a standardized desktop environment that includes a fully integrated APC UPS is key to providing reliable information access to our employees, and that's what we're all here for."

FREE 60-page Power Protection Handbook

☐ **YES!** I'd like more information about Back-UPS Pro.

☐ **NO,** I'm not interested at this time but please send my FREE 60-page power protection handbook.

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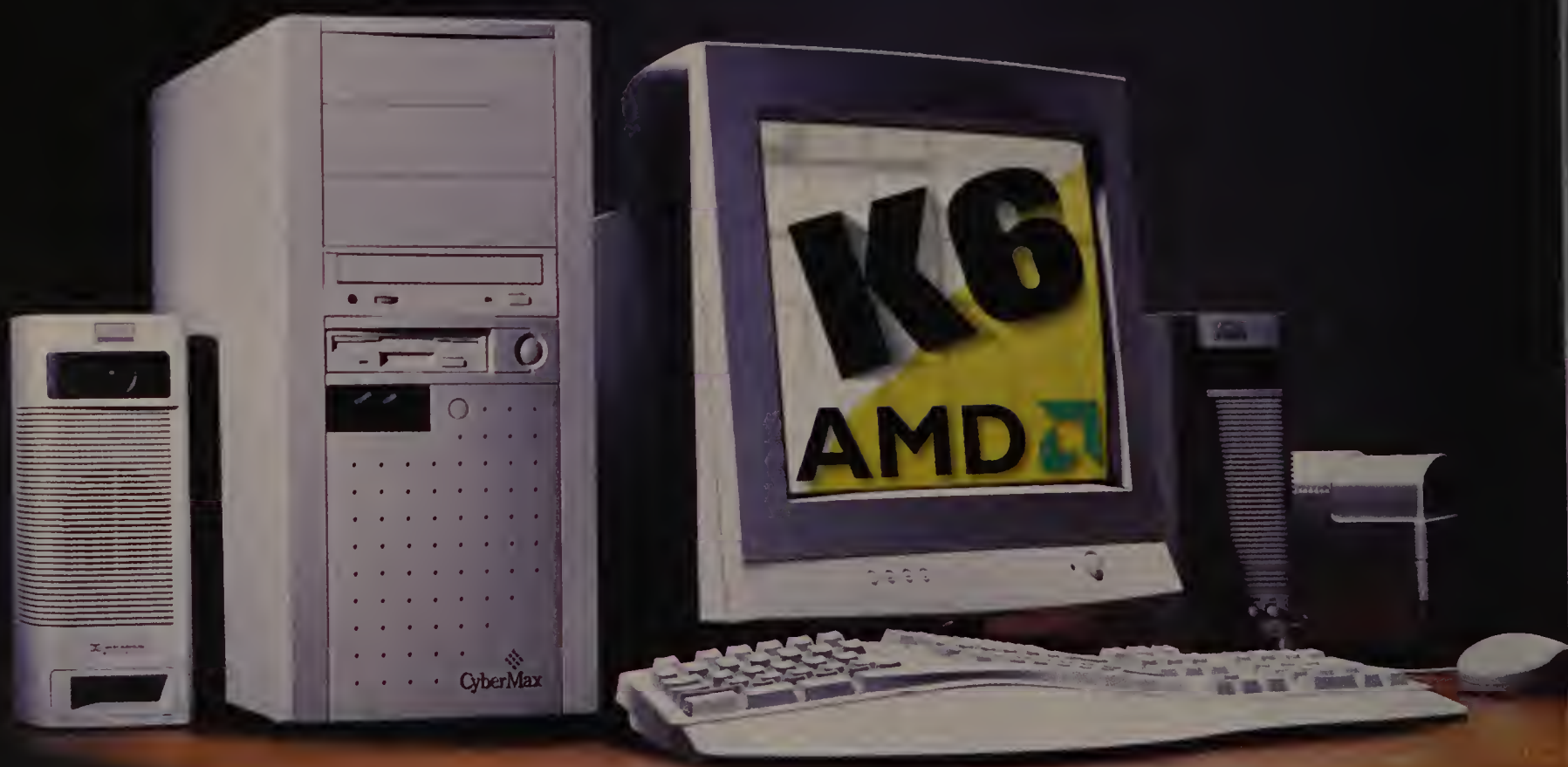

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DO816

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K6-PR2-200.....$2399
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K6-PR2-200.....$2049
Upgrade to 6GB Hard Drive.....$69

DO814

BusinessMax A2 200MMX $ **1849**

Basic Model Specs-see below — Business Lease.... $65

- AMD-K6™ 200MHz Processor w/ MMX™ Technology
- 32MB EDO RAM Memory
- Diamond Stealth 3D 2000 Video Card w/4MB
- 4.0GB Hard Drive
- 16x Max CD-ROM, Ensoniq Wavetable Sound Card
- K56flex™ Protocol Fx/Mdm w/Voice Mail & Spkrphone
- 15" (13.8"VA) 1024x768 Color Monitor
- Altec Lansing ACS45 Speakers
- MS Office Small Bus. Edition w/Max's Software Toolbox

K6-PR2-233.....$1949
Add HP Color Printer.....$299

DO813

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Basic Model Specs-see below — Business Lease.... $52

- AMD-K6™ 166MHz Processor w/ MMX™ Technology
- 16MB EDO RAM Memory
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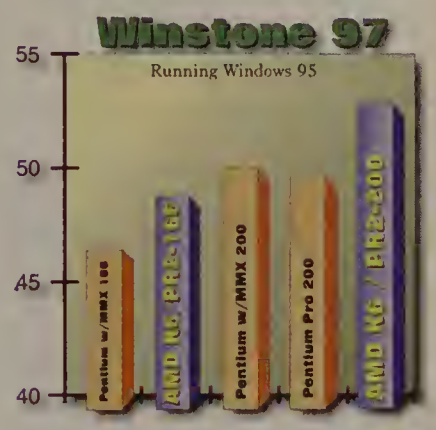

The AMD-K6™ Processor outperformed Pentium® and Pentium® Pro Processors in recent Winstone® 97 testing

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Microsoft Office Small Business Edition or Corel WordPerfect Suite 7, Resume Designer

Finance
Quicken Financial Manager (Special Edition), Barron's Online

Entertainment
Blockbuster Guide, Billboard Music Guide, Electronic TV Host

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Compton's Reference Collection, Idiot's Guide to the Internet w/ Windows 95 Primer, Internet Yellow Pages

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Compton's Interactive Encyclopedia, Me and My World MM Dictionary

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CyberSpace Pack (trial memberships to AOL, Prodigy, CompuServe, Netcruiser, plus Epoch)

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matrox TOSHIBA

Circle 74 on reader service card

Brush Up Your Graphics with Painter 5

GRAPHICS

PAINTER, from MetaCreations/Fractal Design, has always been a graphics program of a different color—and not just because it's packaged in a one-gallon paint can. While many of its image-editing tools can be found in other programs, Painter's strength lies in its unique ability to mimic artists' materials: canvas, paper, chalk, watercolors, even crayons.

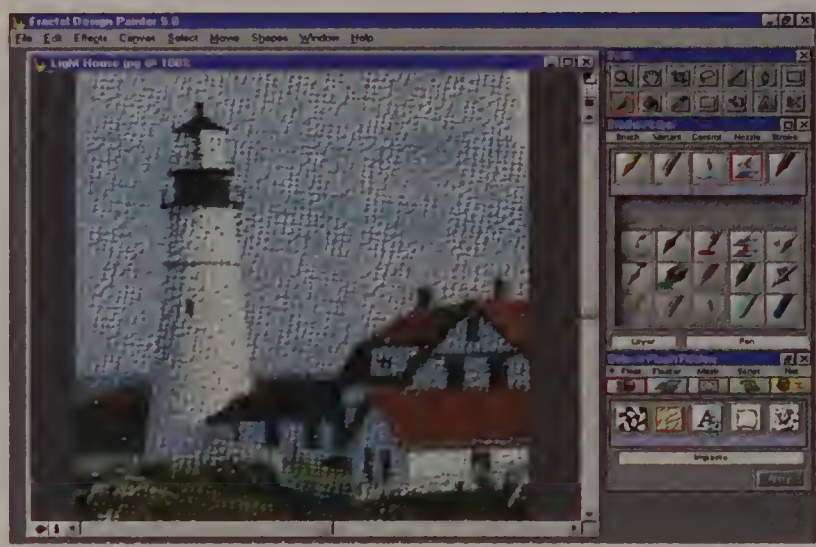
Painter 5, which I examined in prerelease form, also provides an enhanced plug-in architecture that makes possible a wide array of special effects—a camera's blur, 3-D beveled buttons, pop art à la Roy Lichtenstein, burnt and torn image edges, and more.

Other new features in Painter make it easier to work with layers and masks, which are used to create collages, lock in areas, and more. An output preview mode uses the Kodak Color Management System to simulate how an image will look when printed by a specific color printer. Painter 5 can also create animated GIF files for use on Web sites.

The biggest drawback for budding Painters is the user interface, with six primary tool palettes and hundreds of options. A new custom palette feature reduces screen clutter, but it doesn't help novices.

If you want to explore the exotic intersection of natural and digital media, open up a can of Painter. And stir well before using.

—*Jim Heid*



DIGITAL CANVAS: MetaCreations' Painter 5 offers hundreds of options for adding natural-media effects to your photographs.

Painter 5

PRO: Unmatched simulation of natural art media.

CON: Steep learning curve.

VALUE: Good tool for pros; casual artists need not apply.

MetaCreations

408/430-4000

www.fractal.com

List price: $449; upgrade for registered users $99

READER SERVICE NO. 768

QUICK TAKES

Improved AutoCAD

With each new version, AutoCAD becomes more usable by anyone who needs to create precise 2-D and 3-D drawings of products, buildings, or entire worlds. But Autodesk's powerful, $3760 product is intended for design professionals. AutoCAD 14 features extensive online help, a wizard for getting you started, support for texture mapping (to make 3-D models look more realistic), and the ability to save drawings in a compressed Web format so they can be shared with others. AutoCAD 14 is available only for Windows 95 and NT. Autodesk; 800/879-4233; www.autodesk.com.

READER SERVICE NO. 769

—*Brad Grimes*

A Pair of Photo Finishers

IMAGE EDITING

THE CURRENT VOGUE for adding pictures to Web sites, reports, and even personal correspondence has resulted in a bumper crop of easy-to-use software for enhancing digital images. Two such packages—Polaroid's Before & After and Connectix's PhotoMate—help hone your prowess as a digital photographer by sharpening images, improving color contrast, and correcting for improper lighting.

Before & After does its work largely behind the scenes. You select photo quality preferences from a dialog box, and the $30 program takes it from there. The $99 PhotoMate is a hands-on tool that lets you add objects or adjust colors.

Before & After shines when it comes to importing images from devices such as digital cameras and scanners. It directly supports five digital camera models, including Polaroid's own PDC-2000. While PhotoMate supports only Connectix's QuickCam digital camera, it also works with about half a dozen file formats. Before & After works only with .jpg, .bmp, and .tif files; if you have to convert the output of your digital device to another format before your software can read it, you risk losing image clarity.

Overall, PhotoMate is best suited for use with a QuickCam or with images you download from the Web and want to tinker with. Choose Before & After if you use one of the input devices it supports and want your digital images enhanced automatically.

—*Joe Gomolski* ▶

Before & After

PRO: Instant image enhancement.

CON: Limited manipulation options.

VALUE: Good for basic work.

Polaroid Corp.

800/533-9680

www.polaroid.com

Street price: $30

READER SERVICE NO. 770

PhotoMate

PRO: Hands-on manipulation.

CON: Doesn't support proprietary device formats except QuickCam.

VALUE: A good general photo-retouching package.

Connectix

800/950-5880

www.connectix.com

Street price: $99

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Circle 5 on reader service card

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#1 "High-End Accounting Package Juried Shootout" New Jersey Society of CPAs 1997

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Circle 208 on reader service card

Accounts Forgettable

ACCOUNTING

SIMPLY ACCOUNTING debuts as a 32-bit application with version 5.0. But despite many new features, this $129 program still has a gamelike feel and is suitable only for very small businesses.

New features include a purchase order module and the ability to "go negative" on inventory items. A spiffed-up audit trail should please CPAs.

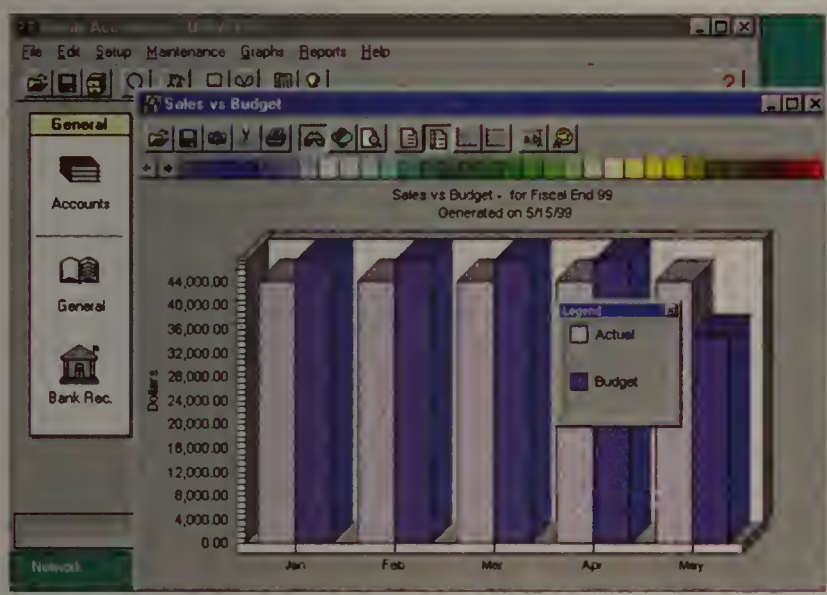
The program ships on six floppy disks—an anachronism in the age of the CD-ROM. On the opening screen, you can hide icons for modules you won't be using (for example, payroll) by clicking on the Setup icon and finding the appropriate tab. However, the Setup options on the drop-down menu are different from the Setup icon options, which is a bit confusing.

One unfortunate design choice retained from earlier versions is the use of a separate icon on the Inventory screen for each item. If your company carries more than a few items, you'll have to scroll through screen after screen to find a specific item.

Simply Accounting also holds on to a few bad DOS habits: You have to set a "Use Date" before transactions can be made; and although records from previous years can be archived, you can't access them once you start the file for a new year. I still don't like the clunky report-customization module, but the graphics are much improved.

Existing users of Simply Accounting should upgrade to take advantage of the additional features. But this doesn't look like a QuickBooks killer.

—*Theresa W. Carey* ▶



SIMPLY ACCOUNTING 5.0 boasts several design and feature improvements, but it remains suitable only for very small businesses.

Simply Accounting 5.0

PRO: Inexpensive, simple icon-based accounting.

CON: Gamelike feel, clumsy date handling.

VALUE: There are better choices available.

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Circle 178 on reader service card

Two New, Easy Ways to Zip and Unzip

UTILITY

DOWNLOAD A compressed 2MB game, double-click the program's executable file, and—*shazam!*—the game begins. Did you miss a step? No. With Mijenix's ZipMagic you can run any application or open and modify any compressed file, without having to unzip the file first.

With ZipMagic, .zip files appear and act like Windows folders, even in terms of performance. Notable features of this $40 utility include a disk-spanning option for zipping large files to floppy disks: Instead of getting a "disk full" notice that aborts the process when you run out of room on a floppy, you'll be prompted to put in a new disk to continue the operation. The utility's Archive Manager scans, repairs, and password-protects zipped files; converts other archive formats to .zip, and launches compression and decompression. You can also easily compress or decompress files by dragging and dropping them or simply renaming the folder (add a .zip extension to compress; remove it to decompress).

I also took a look at the latest beta version (6.3) of ZipMagic's most formidable competitor, Nico Mak's perennially popular WinZip. Like ZipMagic, the $29 WinZip is fully compatible with popular compression formats and e-mail attachments, and offers similar features, including disk spanning and password protection. But WinZip just isn't as convenient—you still need to launch it to access the contents of a .zip file.

ZipMagic does have its limitations: Mijenix wisely warns you not to use it as a space saver to compress previously installed applications, because that can mess up Windows Shortcuts and Registry entries.

For convenience alone, ZipMagic is an excellent tool. But if you're new to compression utilities, you may want to go with a more user-friendly program. WinZip includes clear, thorough online documentation as well as a tutorial and a wizard. ZipMagic lacks all of the above.

—*Julie Campagna*

ZipMagic 1.0

PRO: Convenient; makes .zip files look and act like Windows folders.

CON: Not recommended as a tool for compressing previously installed applications.

VALUE: Useful for quick access to compressed files.

Mijenix Corp.
800/645-3649
www.mijenix.com
Street price: $40

READER SERVICE NO. 773

WinZip 6.3

PRO: Easy to use, excellent online documentation.

CON: Must run the program to access .zip files.

VALUE: Instructive for compression novices.

Nico Mak Computing
800/242-4775
www.winzip.com
Street price: $29

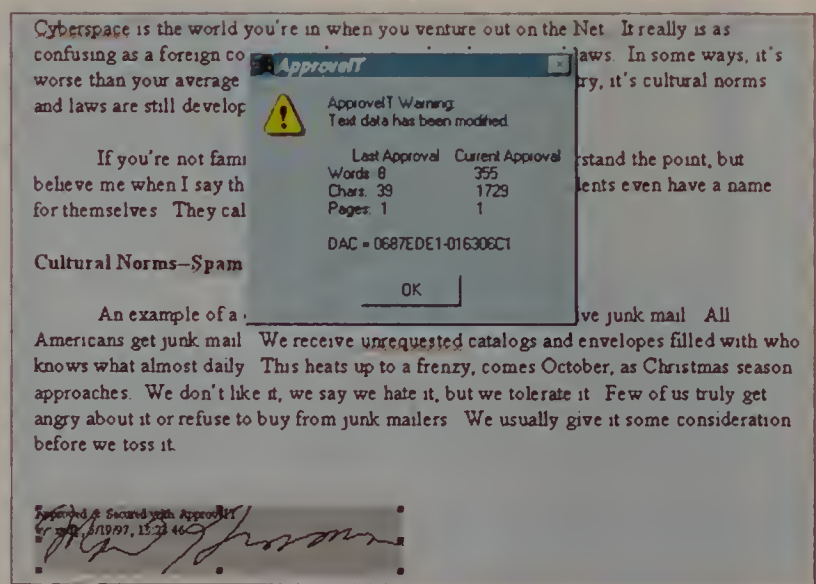
READER SERVICE NO. 774

E-Signatures for the Security Conscious

SECURITY

ELECTRONIC signatures—image files of your scanned John Hancock—are a neat blend of tradition and technology, but up to now they've been a security problem. Once you put your digitized signature on a document, anyone can alter it.

ApproveIt 3.0 for Microsoft Office is an elegant and easy-to-use alternative to Pretty Good Privacy and other dual-key encryption packages that solve this security problem. After installing ApproveIt (as a Word add-on), you create your electronic signature using a pen-based digitizer pad or a mouse. (Scanned signatures are not supported.)



SIGNED, SEALED, AND ALTERED: ApproveIt 3.0 notifies you if a document has been changed since the signature was affixed.

You attach your password-protected signature to a document by clicking on a Word menu option. ApproveIt detects subsequent alterations and then notifies anyone who opens the document (also using Word with ApproveIt) that it has been changed since it was signed. In my tests, a shipping version of the software package installed easily and did its job seamlessly.

While legally binding for most contracts, electronic signatures may not be accepted for wills and real estate documents, which are regulated in specific statutes.

ApproveIt is worth its $149 price tag if you need easy, secure electronic signatures.

—*Mark Grossman* ▶

ApproveIt 3.0

PRO: Easy and secure electronic signatures.

CON: Works only with Microsoft Word.

VALUE: Security features are worth the expense.

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Track Those Billable Hours with Time & Profit

ACCOUNTING

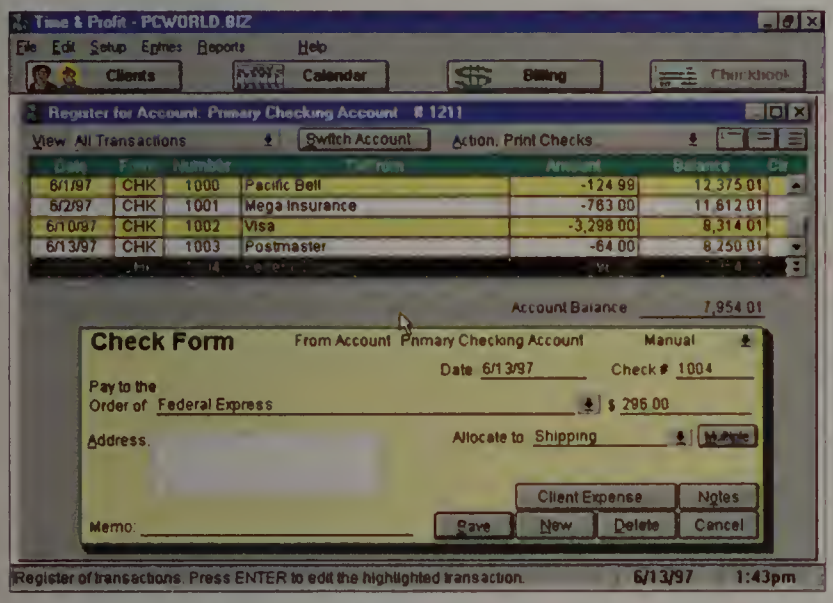
BYTEPRO HAS a winner with Time & Profit 2.0. Aimed at law firms (American Bar Association task codes are built in), consultants, and others who bill on a time basis, the program is flexible and much less complex than the popular TimeSlips. And while TimeSlips makes you export time and billing data to a full accounting package, Time & Profit has those features built in.

I reviewed the $179 single-user version, which can be upgraded to the $485 network version by obtaining a code from the publisher. Users can customize invoices for each client and easily edit pertinent time cards. One valuable report displays each employee's unbilled time, so managers can keep tabs on productivity.

During installation, you specify type of business and form of ownership; you can then jump right in and start entering time records. Employees, clients, jobs, and tasks can be entered on the fly. Timekeepers can maintain calendars in the program, then convert planned jobs to actual billable ones with a few keystrokes.

Unfortunately, the program doesn't use standard Windows conventions—it's not compatible with Microsoft Office, for example. And while you can bill for materials and other expenses, you can't track inventory. But otherwise, this remarkably flexible program should serve the timekeeping professional well.

—*Theresa W. Carey* ■



A CHECKBOOK AND OTHER ACCOUNTING TOOLS add to Time & Profit 2.0's value for people who bill by the hour.

Time & Profit 2.0

PRO: Easy to install, flexible, has built-in accounting features.

CON: Nonstandard interface, no inventory control.

VALUE: Good for small service-based businesses.

BytePro
888/298-3776
www.bytepro.com
Street price: $179 (network version $485 per five-user license)

READER SERVICE NO. 776

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(Digital Briefcase)

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- 2 USB Ports, 2 Serial Ports, 1 Parallel Port
- 17sd69 Monitor (16.0"viewable)

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- 12X EIDE CD-ROM
- Ensoniq™ 3D Wavetable Card plus Amp, Speakers & Mic
- Microsoft® IntelliMouse
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- 17sd69 Monitor (16.0"viewable)
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ONE-STOP GUIDE to today's internet

ILLUSTRATIONS BY JIM LUDTKE

THERE'S NO ESCAPING IT. The Internet has changed how we work. It's the easiest way to stay in touch and the fastest way to get the jump on your competition. And who knows? Someday it may even help you make money.

But getting on the Net isn't always easy or fast. The tools are more powerful than ever—and more complicated. The content is richer, but it takes forever to download. And you'll have to wade through a sea of snake oil to get there.

How do you make the Net work for you? We start with your software. "Browser Secrets" serves up 50-plus tips for versions 3.*x* and 4.0 of Netscape Navigator and Microsoft Internet Explorer. Don't leave your home page without them.

Sure, that Web site looks genuine, but can you trust what you find there? "Web of Deceit" reveals how Net marketeers disguise ad copy as objective information—and how to tell the difference.

Meanwhile, "Bandwidth on Demand" examines the fastest routes to the Internet, from 56K modems to satellite hookups. We tell you what's available, what's coming, and what it will cost you.

Though the Web gets all the glory, it's e-mail that gets the real work done. In "First-Class E-Mail," we identify the best Internet mail packages for your needs.

We've saved the best for last. "Best of the Net" serves up the 101 top places to get help with your PC, grow your business, plan a trip, and much more.

So even if the Internet hasn't yet changed your life, don't worry—it will. Our one-stop guide will help you change it for the better. —*Daniel Tynan*

169 First-Class E-Mail **190** Best of the Net

browser secrets

50-plus tips for mastering Netscape and Explorer.

By Valerie Ryan

THE INTERNET GOES through more changes than Bill Clinton's cabinet. Unfortunately, the software you use to access it changes almost as quickly.

Browsers like Netscape Navigator and Microsoft Internet Explorer have evolved from simple Web-surfing tools into do-everything Internet suites. You can use them to manage e-mail, scan discussion groups, share your work with distant colleagues, and even talk to Mom on a "videophone." To complicate things even further, Netscape and Microsoft each offer two versions of their hugely popular products: a simpler version 3.*x* and the still-evolving "preview" version of their new, not-quite-finished suites.

How can you possibly keep up? That's where we come in—to serve up a heap of useful tips for Netscape Navigator 3.*x*, Internet Explorer 3.*x*, and the brand-new Netscape Communicator and Internet Explorer 4.0 suites. We'll help make it easier to find the Web sites you want, download files quickly, and send e-mail that everyone can read. We'll also help you collaborate with co-workers over the Internet and tell you how to get Web content sent directly to your screen.

One caveat: Because we used prerelease versions of Communicator and Internet Explorer 4.0 in our testing, some features and menu options may change between our writing this and your reading it. But with the Net, change is the one thing you can rely on. ▶

ILLUSTRATIONS: JIM LUDTKE

RIGHT-CLICK
URL ADDRESS
DELETE
PLUG-INS
NOT
NEEDED
EMAIL
DELETE
PLUG-IN

Navigating the Web

What's the best way to get to a new Web site? Or to get back to where you've already been? Here are some of the fastest and easiest ways to get around on the Web.

Less (Typing) Is More You don't have to type full Web addresses. If you're trying to get to http://www.something.com with either version of **Internet Explorer (IE)**, just type **something.com**. In **Navigator 3.x (N3)** or Communicator's **Navigator 4.0 (N4)**, a simple **something** will do. All four programs assume the 'http://www.', and both Netscape products assume the '.com'. If the URL varies from those settings—for instance, if it ends with .org, .net, or .gov—you'll have to type everything except the 'http://', as in **www.something.org**.

Home Is Where the URL Is The home page is the easiest page to get to, so make it a page you visit often. In **N3**, select *Options•General Preferences* and click the *Appearance* tab. Then select *Home Page Location*, enter the desired URL, and click *OK*. In **N4**, go to your choice for a new home page and select *Edit•Preferences*. Go to the *Navigator* category, and in the Home Page section click *Use Current Page*.

It's easy to assign a home page in **Internet Explorer 3.x (IE3)** or **4.0 (IE4)**. Go to your ideal home, select *View•Options*, and on the *Navigation* tab make sure that the Page option is set to *Start Page*. Click *Use Current*, then *OK*.

Links to Links You can add a Bookmark or Favorite without visiting the site first. Right-click the link and select *Add Bookmark* (in **N**) or *Add to Favorites* (in **IE**).

Up Close and Personal Links If you visit a Web site frequently, place links to it on your Personal Toolbar or Links bar. In **N4**, if you don't see the Personal Toolbar, select *View•Show Personal Toolbar*. Go to the desired page and drag the *Netsite* or *Location* icon onto your Personal Toolbar. You can edit the toolbar by clicking the *Bookmarks* button, selecting *Edit Bookmarks*, and opening *Personal Toolbar Folder*. This feature isn't available in **N3**.

Both **IE3** and **IE4** let you place links on a bar. Go to the page, select *View•Options*, and click the *Navigation* tab. Select an unused link in the Page list, then click *Use Current*. Click *Apply*.

Rename Your Bookmarks/Favorites In **N3**, select *Bookmarks•Go to Bookmarks*; in **N4**, click the *Bookmarks* button and select *Edit Bookmarks*. In the resulting Bookmarks window, right-click a Bookmark, select *Properties* in **N3** or *Bookmark Properties* in **N4**, type any name you'd like in the Name field, and press **<Enter>**.

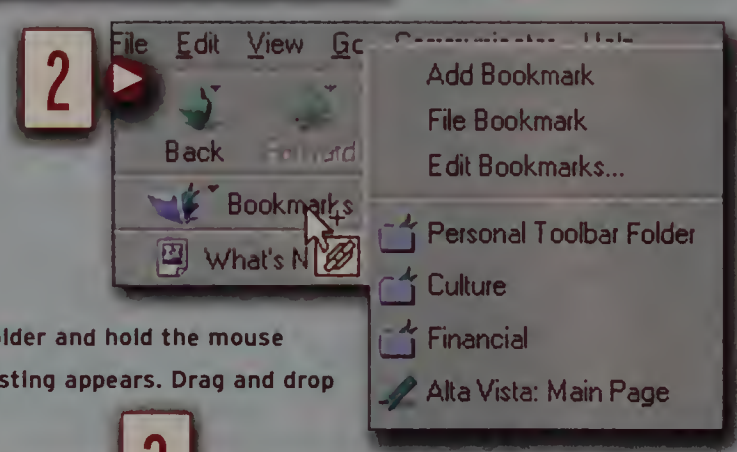
In **IE3** or **IE4**, select *Favorites•Organize Favorites*. In the resulting dialog box select a Favorite, click *Rename* or press **<F2>**, type a new name, and press **<Enter>**.

Put Your Bookmarks and Favorites in Their Place If your Bookmarks or Favorites menu is getting too long, add subfolders and move some of the entries into them. In **N3**, select *Bookmarks•Go to Bookmarks* and select the folder in which you'd like to place a new subfolder. Select *Item•Insert Folder*, type a name for the folder, and click *OK*. In **N4**, select *Bookmarks•Edit Bookmarks*, select the folder where the new subfolder will go, and select *File•New Folder*. Type a name for the new folder and press **<Enter>**. In either version, you can drag and drop Bookmarks into folders and move folders into other folders.

DRAG AND DROP A NAVIGATOR BOOKMARK

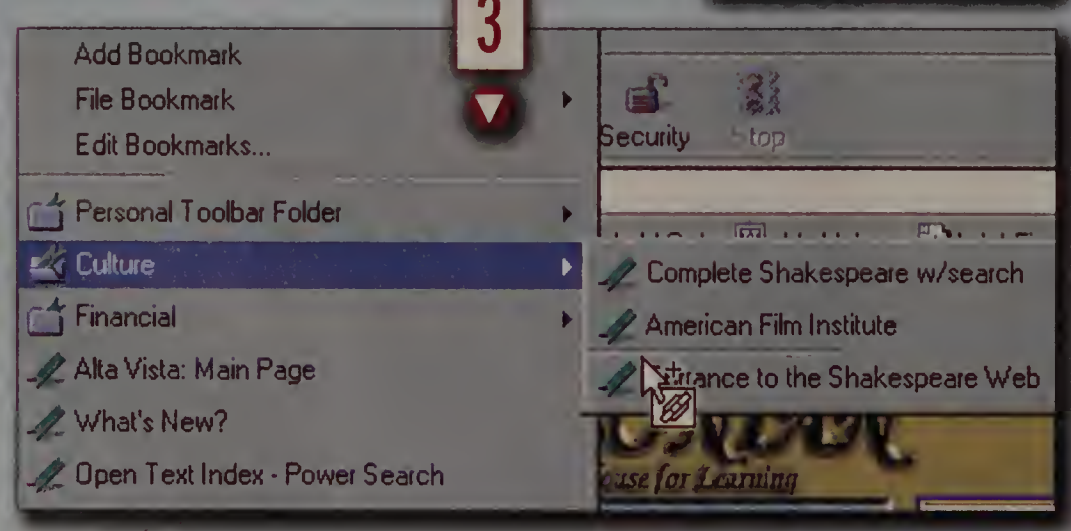
In Netscape Communicator's Navigator 4.0, you can save a new Bookmark and put it into a particular subfolder at the same time.

1 Hold the mouse pointer over the *Netsite* (or *Location*) icon until the pointer changes to a hand.



2 Click and drag the icon to the nearby *Bookmarks* button and hold until the Bookmarks menu appears.

3 Drag the icon down to a folder and hold the mouse pointer until a subfolder listing appears. Drag and drop the icon into a subfolder.



In IE3 or IE4, select *Favorites•Organize Favorites*. Click the *Create New Folder* icon, type a name for the new folder, and press <Enter>. To move a Favorite into a folder, select the Favorite, click *Move*, and select the folder. In IE4, you can also drag the file to the new folder.

Desktop Access For quick access to a particular Web page, place a Shortcut to it on your Windows desktop; double-clicking the Shortcut will launch your browser directly to that page. In any of the programs, right-click a blank area of the page. In N3, select *Internet Shortcut*; in N4, IE3, or IE4, select *Create Shortcut*. In N4, you can also drag the icon (next to the address on the Location or Netsite bar) onto the desktop.

Search in Place In all the browsers except N3, you can search the Web without first going to a search engine. Simply type **go** and the word or phrase you're looking for anywhere you would otherwise type a URL.

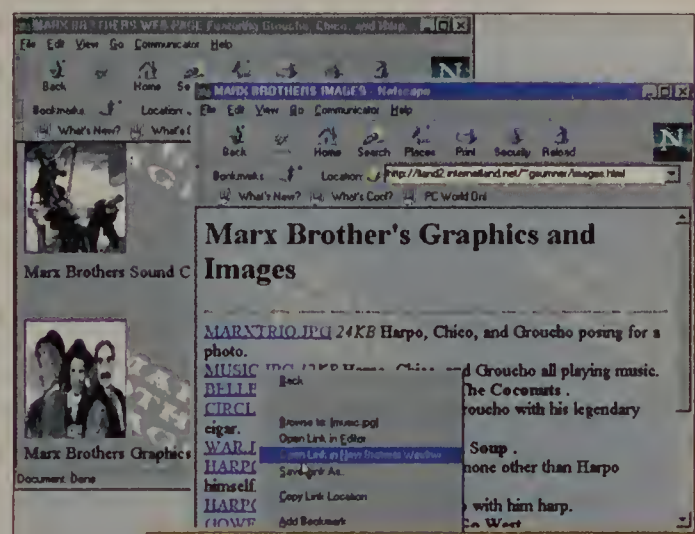
Browsing in Two Places at Once To follow a link and stay at the current page, in N3 or either version of IE, right-click the link and select *Open in New Window*. In N4, select *Open Link in New Browser Window*.

Making the Best Browser

Want to surf faster? See more on the screen? Or read text without having to squint? Tinkering with your browser's settings can make pages load more quickly and scroll more easily. Here's how to do it.

Pictureless Browsing Images take a long time to come through a browser, so you can speed up your download time by surfing without the pictures. In N3, deselect *Options•Auto Load Images*. In N4, select *Edit•Preferences*, choose *Advanced*, deselect *Automatically load images*, and click *OK*.

In IE3 or IE4, select *View•Options*, and at the *General* tab deselect *Show Pictures*. (You can also deselect *Sounds* and *Videos* to avoid other big downloads.)



TWO BROWSER WINDOWS are often better than one—and easy to set up. See "Browsing in Two Places at Once."

Image, Come Back If you're working in no-picture mode, you'll occasionally want to view individual images, something all of the programs allow. In N3 or N4, right-click a graphic's placeholder icon and select *View Image* in N3 or *Show Image* in N4. In IE3 or IE4, right-click the placeholder icon and select *Show Picture*.

Pick Your Font Size If your browser's default font size is too large, you'll have to scroll a lot more. If it's too small, your eyes will get tired. Either way, you'll want to change the font size.

N3 offers no special way to do this, but it is possible. Select *Options•General Preferences* and click the *Fonts* tab. Then click *Choose Font* next to the font (Proportional or Fixed) you'd like to change, and select a different size. In N4, it's much easier: Select *View•Increase Font* or *View•Decrease Font* or press <Ctrl>-] or <Ctrl>-[. In IE3 or IE4, select *View•Fonts* and choose one of the five size options.

Outta-Sight Toolbars It's a simple equation: Fewer toolbars, link bars, address bars, and other types of bars equals more window space for browsing and less need for scrolling. So if you don't regularly use a toolbar, hide it. In N3, go to the *Options* menu to deselect the undesired toolbar. In N4, click once on a toolbar's left edge to collapse it.

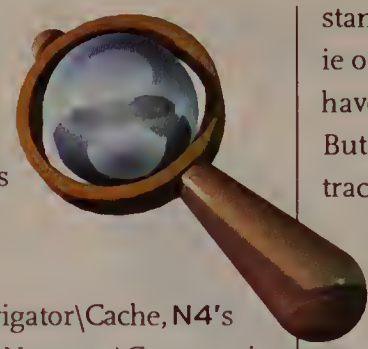
In IE3 or IE4, select *View•Options*. On the *General* tab deselect any or all of the options in the Toolbar box and click *OK*. To hide all toolbars at once, go to the *View* menu and deselect *Toolbar*. ▶

THE BASIC KEYSTROKES IN ALL BROWSERS

Don't let your mouse slow you down. These keystrokes speed your browsing.

Action	Navigator	Internet Explorer
Go back	<Alt>-<Left>	<Alt>-<Left> or <Backspace>
Go forward	<Alt>-<Right>	<Alt>-<Right> or <Shift>-<Backspace>
Go to URL	<Ctrl>-l (in 3.*x*) or <Ctrl>-o (in 4.0)	<Ctrl>-o
Show history	<Ctrl>-h	<Ctrl>-h
Stop page loading	<Esc>	<Esc>
Edit Bookmarks/Favorites	<Ctrl>-b	<Ctrl>-b
Add Bookmarks/Favorites	<Ctrl>-d	<Ctrl>-d
Find on current page	<Ctrl>-f	<Ctrl>-f
Print current page	<Ctrl>-p	<Ctrl>-p
Reload current page	<Ctrl>-r	<Ctrl>-r or <F5>
Save current page as	<Ctrl>-s	<Alt>fa
New browser window	<Ctrl>-n or <Shift>+click link	<Ctrl>-n
Close current window	<Ctrl>-w	<Ctrl>-w
New message	<Ctrl>-m	<Alt>fm (in 3.*x*) or <Alt>fnm (in 4.0)
Increase font size	<Ctrl>-<Plus>	n/a
Decrease font size	<Ctrl>-<Minus>	n/a

Protect Yourself From Snoops



Who knows what sites you've been visiting? Anyone sitting down at your PC can find out, and so can people whose sites you visit—unless you take a few simple precautions.

Leave No History If you don't want people in your office or home to know which sites you've been visiting, the first thing you should do is clear out your browser's History list. In **N3**, simply close the program—the History folder will clear itself out (a rare case where a shortcoming can also be useful). In **N4**, select *Edit•Preferences*, choose *Navigator*, and click *Clear History*. In **IE3** or **IE4**, select *View•Options*, click the *Navigation* tab, and click *Clear History*.

An Empty Address and No Location People may snoop in the current URL displayed at the top of your browser window (labeled Address in Internet Explorer, and either Location or Netsite in Netscape, depending on site specifics). If you're using **IE3** or **IE4**, clearing your History folder (see "Leave No History" above) will wipe out the Address list. No such luck with the Netscape products.

You can clear the list by futzing with the Windows 95 Registry, but that's difficult and dangerous. A better solution is simply to not use the list. If you type in a URL at the Open Location dialog box (**<Ctrl>-l** in **N3** and **<Ctrl>-o** in **N4**), the address won't be recorded in the Location or Netsite list.

Where's the Cache? A third place people will look for your Web trail is the *cache folder*—a temporary storage area for recently visited pages and images. You can delete its contents after a browsing session, but there's a cost: You'll have slower surfing next time as your browser downloads files it might have found locally.

The exact location of the cache folder depends on decisions you made when you installed your browser. However, **N3**'s cache folder is probably C:\Program Files\Netscape\Navigator\Cache, **N4**'s is C:\Program Files\Netscape\Communicator\Users*username*\Cache, and **IE**'s is C:\Windows\Temporary Internet Files. Use Windows 95's Explorer to delete the folder's contents.

Beware the Cookie Monster Certain Web sites place special "cookie" files on your system that let them recognize you the next time you visit—and possibly track where you go in between. Cookies add some convenience to your life; for instance, if a site can recognize you by a cookie on your computer, you probably won't have to type in a password at every visit. But cookies can invade your privacy by tracking which sites you visit and giving marketers a profile of your interests, so you may want to turn them off.

In **N3**, select *Options•Network Preferences*, click the *Protocols* tab, and in the Show an Alert Before box check *Accepting a Cookie*. In **N4**, select *Edit•Preferences*, choose *Advanced*, and select *Warn me before accepting a cookie*. Or, if you'd like the browser to reject cookies without asking you, select *Disable cookies*.

In **IE3** or **IE4**, select *View•Options* and click the *Advanced* tab. In **IE3**, select *Warn before accepting cookies*. In **IE4**, just to make things confusing, you must deselect *Do not warn before accepting cookies*.

Juggling Files

How do you get a file off an FTP server? Or upload a file to one? And what about all those plug-ins littering your hard drive? We've got answers to all these problems.

FTP Downloading You can use any browser to download a file from a file transfer protocol server. Enter the server's URL (which will probably start with 'ftp://' rather than 'http://'), navigate your way to the file you'd like to download, and then click it.

FTP, Windows 95-Style None of the browsers can upload and manage files on an FTP server. But Windows 95 can—if you don't mind dealing with a crude command-line interface. At the *Start* menu, select *Run* and enter the command **ftp**. At the resulting prompt, type **open**, followed by the name of your host—for example, **open ftp.microsoft.com**. For full instructions, go to the Windows 95 CD-ROM's admin\reskit\helpfile folder, launch the file win95rk.hlp, and search for **ftp**.

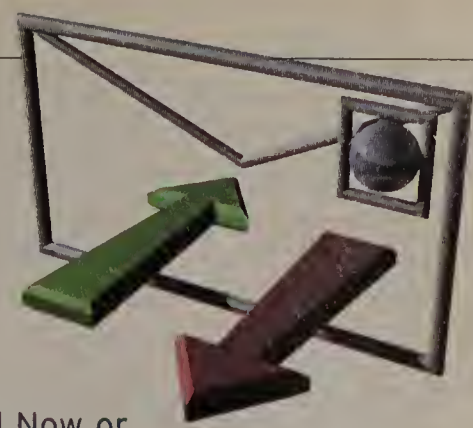
Finding a Better FTP If Windows 95's FTP utility doesn't please you (and it probably won't), you can download a third-party shareware tool. Two good ones are Ipswitch's WS_FTP (www.ipswitch.com/pd_wsftp.html) and GlobalScape's CuteFTP (www.cuteftp.com).

Get Yer Plug-Ins Here! If you decide that you have to have a particular plug-in or are looking for a certain type, point your browser to home.netscape.com/comprod/products/navigator/version_2.0/plugins/index.html. There you'll find Netscape's extensive list of plug-ins, with links to each. Many of them will work with Internet Explorer as well as with Navigator. Another good resource is BrowserWatch's Plug-In Plaza at browserwatch.iworld.com/plug-in.html.

Getting Rid of Plug-Ins Feel that a plug-in isn't doing anything but wasting space? Luckily, most of them have uninstall routines. From Windows' *Start* menu, select *Settings•Control Panel*. Double-click *Add/Remove Programs* and select the unwanted plug-in from the list.

Sending and Receiving E-Mail

Spending too much time using e-mail? Whether you're using Netscape Mail, Communicator's Messenger, or Internet Explorer's Internet Mail or Outlook Express, these tricks help make electronic correspondence easier and less time-consuming.



Make Your Messages Readable

Some e-mail programs can create HTML-formatted messages, but not all programs can read them. To make sure your messages are readable, shut off HTML. In Communicator's **Messenger 4.0**, select *Edit•Preferences* and click *Message* under Mail & Groups. Deselect *By default, send HTML messages*. While N3's **Netscape Mail** can display HTML-formatted messages, it can't send them.

In either Internet Explorer version, go to the Mail Options dialog box (in IE3's **Internet Mail** select *Mail•Options;* in IE4's **Outlook Express** select *Tools•Mail Options*), click the *Send* tab, and check *Plain Text* to deselect HTML.

Send Now or Later

All of the programs let you send messages immediately or save them in an out-box until you're ready to go online. Use the first option if you access the Internet through a local area network and the second if you use a modem.

The Netscape programs default to sending messages immediately. To ▶

sorting out e-mail file attachments

WHEN YOU SEND someone an e-mail message over the Net with a file attached—be it a word processing document, a picture, or a .zip archive—they might receive the message and the file. Or they might receive thousands of seemingly random characters, as if a demented stenographer had just done 8 hours of random typing after downing 19 double cappuccinos.

The problem is that the Internet's e-mail standard is intended for sending text, not files. Before a file can be mailed, it must be turned into something that looks like plain text to a PC. On the receiver's end, the text then has to be converted back into the original file. This requires that both sender and receiver have software that supports the same encoding standard. And there are three common standards: UUencode, Base64 (a subset of MIME), and BinHex.

It's good to know what standards your e-mail and your recipient's support (see "Sending Files Over the Internet"). If you receive your e-mail through a company LAN, ask the IS department. If all else fails, exchange some files and see what you get. Try Base64 first, as that's becoming the most popular standard.

Internet Explorer's e-mail programs can encode files using UUencode or Base64, letting you pick a format your recipient's software can handle. Go to the Mail Options dialog box (in Internet Mail select *Mail•Options;* in Outlook Express select *Tools•Mail Options*). Click the *Send* tab, select *Plain Text*, and click the *Settings* button. In the resulting dialog box, select *Uuencode* or *MIME (Base64)*. (The Netscape programs send only Base64 attachments.)

If you receive a mass of meaningless characters at the end of an otherwise short and comprehensible message, it's probably the remains of a file attachment your e-mail program couldn't decode. To determine what standard was used, look for a statement just before the gobbledygook—like 'Content-Transfer-Encoding: Base64', 'begin 600 picture.gif' (which signifies UUencoding), or 'Content-Type: application/mac-binhex40; name=" picture.gif"'.

If you and your recipients don't have compatible e-mail programs, use a third-party encoder/decoder. This solution isn't as convenient as using a compatible e-mail program, but it works. Among the downloadable shareware and freeware programs that will do the job are WinZip (www.winzip.com), Wincode (www.members.global2000.net/snappy/wincode.html), Decode Windows 95 Shell Extension (home.sprynet.com/sprynet/funduc), and XferPro (www.sabasoft.com).

SENDING FILES OVER THE INTERNET

Do you know what file attachment standards your e-mail package can send and receive?

E-MAIL PROGRAMS AND SERVICES	UUencode		Base64		BinHex	
E-mail front ends	Send	Receive	Send	Receive	Send	Receive
Eudora Pro 3.0	●	●	●	●	●	●
Microsoft Exchange/Windows Messaging	●	●	●	●	○	○
Microsoft Internet Mail 3.0	●	●	●	●	○	●
Microsoft Outlook Express 4.0	●	●	●	●	○	●
Netscape Mail 3.0	○	●	●	●	○	●
Netscape Messenger 4.0	○	●	●	●	○	●
Pegasus Mail	●	●	●	●	●	●
Online services [1]						
America Online 3.0	○	●	●	●	○	●
CompuServe 3.0	○	○	○	○	○	○
Microsoft Network [2]	●	●	●	●	○	○
Prodigy Internet	●	●	●	●	●	●

● Yes ○ No

[1] All online services have proprietary systems for sending attachments.
[2] Uses Microsoft Exchange/Windows Messaging.

change that setting, in **Netscape Mail**'s New Message window select *Options•Deferred Delivery* before clicking *Send*. In **Messenger**, you can delay a message by selecting *File•Send Later*. To send, select *File•Send Unsent Messages*.

Internet Explorer defaults to storing your files in an out-box for later delivery. To change that default in **Internet Mail** select *Mail•Options;* in **Outlook Express** select *Tools•Mail Options*. On the *Send* tab select *Send messages immediately*.

Signed and Sealed Let your mail program type your name and contact information at the end of each message. For the Netscape programs, first use Windows' Notepad to create a text file containing your desired "signature." Then select *Options•Mail and News Preferences* and click the *Identity* tab in **Netscape Mail**, or select *Edit•Preferences* and go to the *Identity* category in **Messenger**. Once there, click *Browse* to pick your file.

With either Internet Explorer mail program, you have a choice between saving the signature in a separate text file or as part of your program's configuration. Select *Mail•Options* (**Internet Mail**) or *Tools•Mail Options* (**Outlook Express**). Click the *Signature* tab. You can then select *Text* and type your signature in the available box, or click *File* to point to a text file.

Group Mailing If you frequently send e-mail to the same group of recipients, create a mailing list for one-step addressing. While creating a new message in **Netscape Mail**, select *Window•Address* ▶

bringing information to you

WHY WAIT FOR information to come through your modem when it can be waiting for you in the morning? With offline browsing and "push" technology, software can download the information you want from the Internet while you're away. Here are some tips for grabbing data with Internet Explorer 4.0 and PointCast Network, a popular third-party push program. Netscape Communicator's push component, Netcaster, wasn't ready in time for this article.

Internet Explorer 4.0: Data to Your Desktop Put a Web page on your desktop. To do this, Shell Integration must be enabled—and it is, unless you've turned it off with Control Panel's Add/Remove Programs utility.

Right-click the desktop and select *Properties*, then click the *Desktop* tab. Click *New*, select *Web Site*, and click *OK*. Type the full URL (the desktop won't assume the 'http://' part), press <Enter>, and answer the questions about when you want the Web page updated and so on. When you click *OK*, the page will be there. Drag its top left corner to move it and the bottom right corner to resize it. To update it, right-click the page and choose *Refresh*.

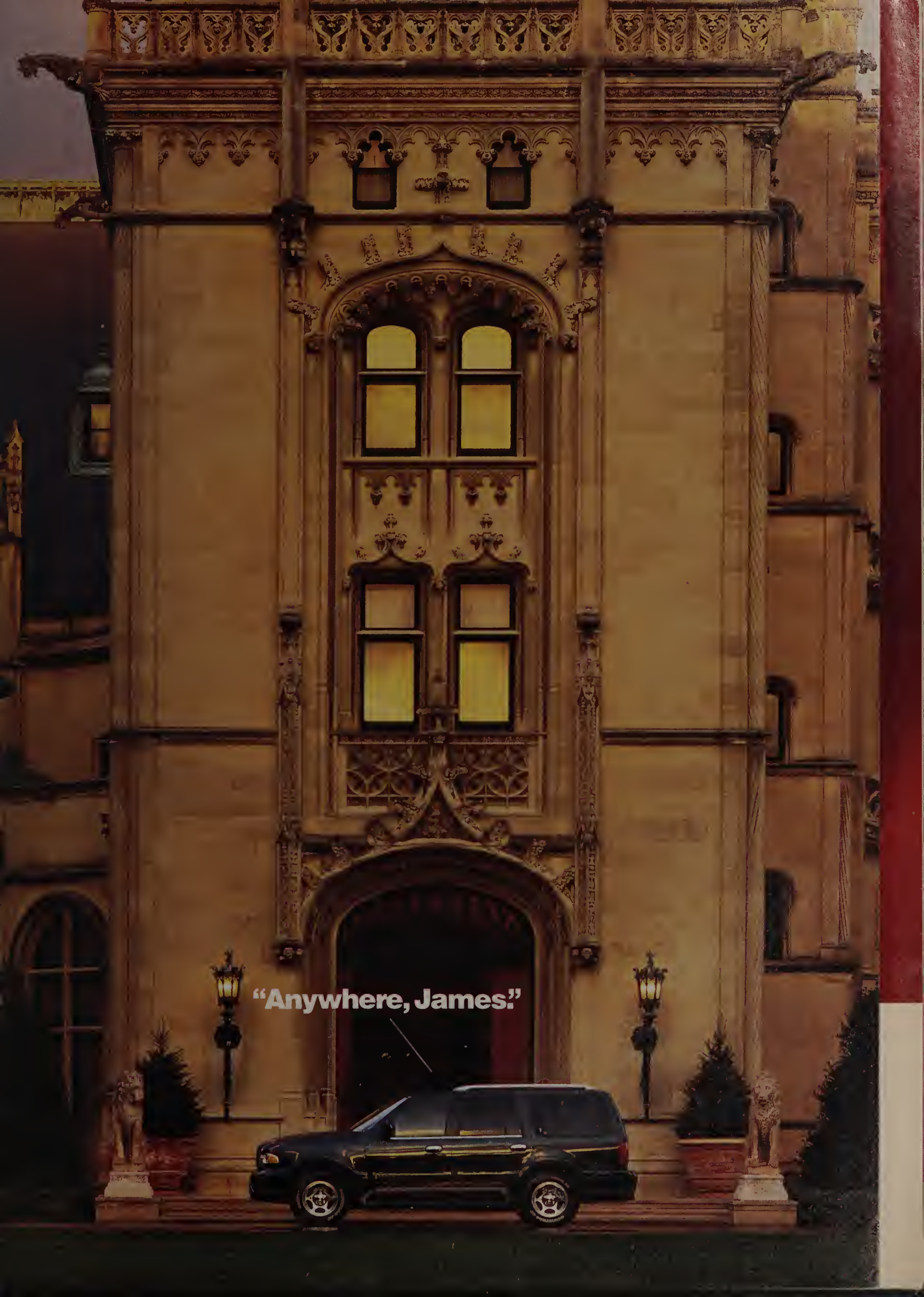
Internet Explorer 4.0: Active Components Where do you go to get "components"—that is, HTML-based information sources that you can put directly onto your IE4 Active Desktop? The obvious place to go is Microsoft's Component Gallery (www.microsoft.com/ie/ie40/gallery/), but who wants to explore only the obvious? You might want to check out two independent sites that also offer tips, news, and more components: www.activeie.com and www.iegallery.com.

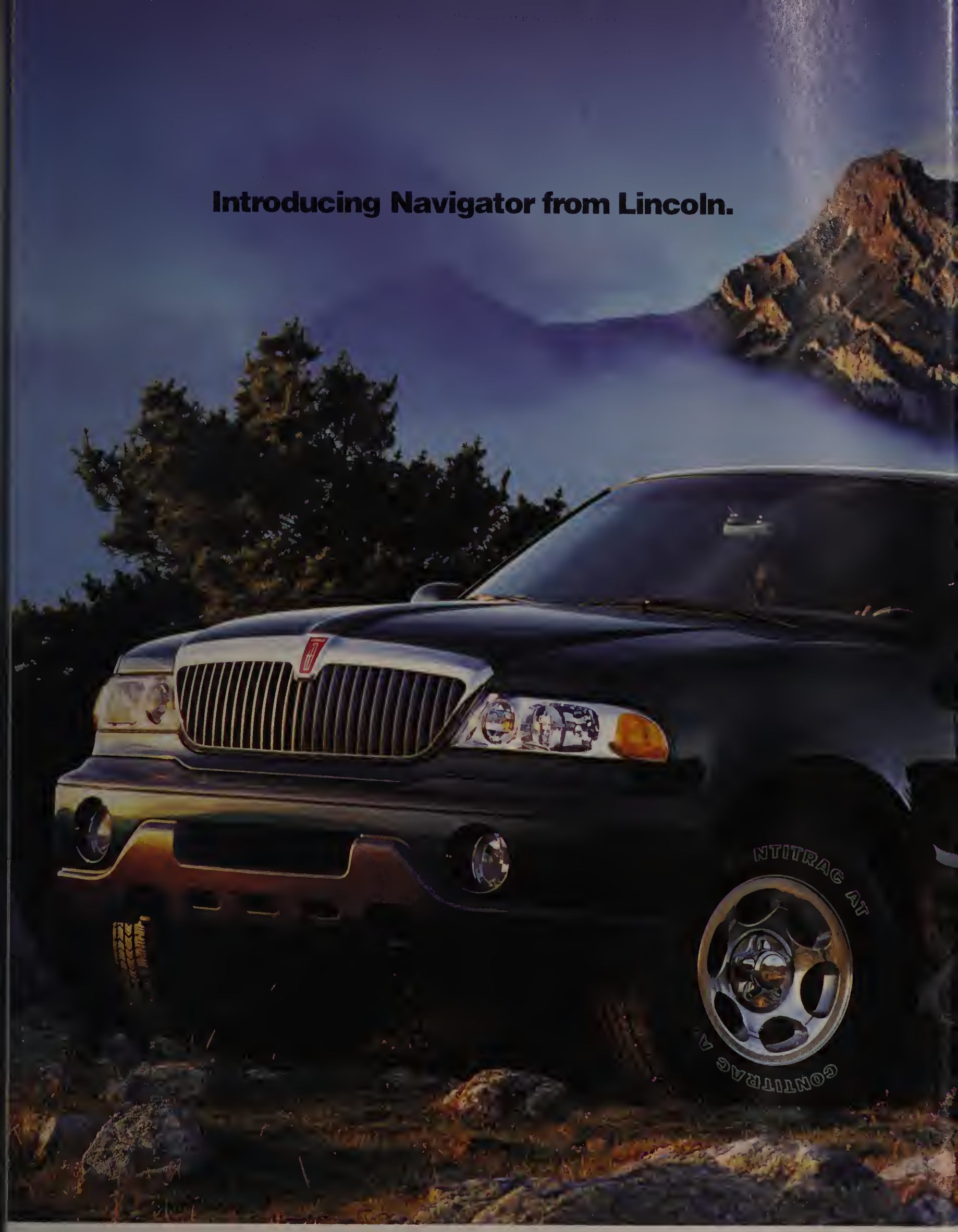
Internet Explorer 4.0: Manual Update To update all your desktop components, simply press <F5>. This renews your entire desktop, including active components.

Internet Explorer 4.0: Subscribe to a Favorite Don't waste time surfing familiar sites. Subscribe to them and IE4 will periodically visit the pages and download new information. To subscribe to a site that's already in your Favorites folder, select *Favorites•Organize Favorites*. Right-click a Favorite and select *Properties*. Click the *Subscription* tab, then click the *Subscribe* button. In the resulting tabbed dialog box, you can set how often Internet Explorer checks the site (daily, weekly, or at other intervals), what it downloads (Images, linked pages), and how it notifies you.

PointCast: Setting the Schedule When PointCast Network downloads information, your system can slow down noticeably, so let PointCast do its online work when you're not around. You can set the service to update its information at set intervals—for instance, at midnight or some other time when you're bound not to be bothered by it. Click the *Options* button, click the *Update* tab, and choose *Update with my customized schedule (set below)*. Set the details in the dialog box's Custom Update Schedule box.

PointCast: Turn Off the Screen Saver When you install PointCast Network, it automatically becomes your screen saver, pushing information onto your computer when you're away. But this isn't always an ideal situation. If you use a modem, you may want to have the line free for phone calls or faxes. Or you may just prefer flying toasters. You can't turn this feature off in PointCast, but you can in Windows 95. Right-click the desktop, select *Properties*, click the *Screen Saver* tab, and at the *Screen Saver* pulldown menu select anything but PointCast Network. Yes, there is a '(None)' option—the first one.


"Anywhere, James."



The new Lincoln Navigator is the most luxurious way to travel...anywhere. A rugged and refined full-size luxury sport utility vehicle with a 5.4-liter V-8 engine, up to 8,000 pounds towing capacity, available Control-Trac four-wheel drive and a spacious

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Circle 132 on reader service card

Book. Select *Item•Add List*, give the list a name, and press **<Enter>**. The list will appear in your address book, where you can drag existing recipients. In **Messenger**'s Message Composition window, select *Communicator•Address Book* and click *New List*. Start typing names into the list—Messenger will complete them.

In **Internet Mail** select *File•Address Book* or in **Outlook Express** click the *Address Book* icon. Click the *New Group* icon. Type a name for the group and click *Select Members*. Hold down **<Ctrl>** as you select recipients for the group. Click *Select*, then click *OK* twice.

Neat and Tidy Messages If your in-box is getting full, move some messages to other folders. In **Netscape Mail**, select *File•New Folder*, type a name, and press **<Enter>**. Then drag messages into the new folder. Create a new folder the same way in **Messenger**, then right-click a message and select *File Message* to move it.

In **Internet Mail**, select *File•Folder•Create*. To relocate a message, right-click it and select *Move to* and the name of your folder. In **Outlook Express**, select *File•Folder•New Folder*. Drag and drop any message on the new folder.

Bozo Filter Three of the programs will let you send messages from an annoying person directly to the dead-letter office. In **Messenger**, select *Edit•Mail Filters* and click *New*. **Netscape Mail** doesn't offer a bozo filter. In **Internet Mail**, select *Mail•Inbox Assistant* and click *Add*. In **Outlook Express**, select *Tools•Inbox Assistant* and click *Add*.

Footloose and Password-Free If you feel it's safe, disable your e-mail program's password feature and save a little time and effort loading the program. In **Netscape Mail**, select *Options•Mail and News Preferences*, click the *Organization* tab, and select *Remember Mail Password*. In **Messenger**, select *Edit•Preferences* and click the *Mail Server* category under Mail & Groups. Then click *More Options* and select *Remember my mail password*.

In **Internet Mail**, select *Mail•Options*, and on the *Server* tab enter your password. In **Outlook Express**, select *Tools•Accounts*, select your mail account, and click *Properties*. On the *Servers* tab, type your password.

ADD A SIGNATURE to your e-mail messages to cut down on repetitive typing. See "Signed and Sealed."

Participating in Newsgroups

With newsgroups, you can post or read messages on thousands of topics. Here's how to track all those messages in Netscape News, Collabra, Internet News, and Outlook Express.

The Search Is On There are a lot of newsgroups out there, and unless you're using **N3**, your news program can help you find the right ones. In Communicator's **Collabra** newsreader, click the *Subscribe* button. In the resulting dialog box, click the *Search for a Group* tab. Type what you're looking for (such as **windows**) on the Search line and press **<Enter>**.

In either **IE** news program, click the *Newsgroups* button and type your search criteria in the 'Display newsgroups which contain' field. No need to press **<Enter>**—the program searches automatically.

TO SORT YOUR newsgroup by related postings, select *View•Sort•by Thread*. See "Messages in Threads."

Reading and Writing Offline With any of the newsreaders except **N3**'s, you can cut online time by downloading messages for reading offline. Hold down **<Ctrl>** as you select interesting-looking messages. Then, in **Collabra**, select *File•Get Messages•Selected for Offline Reading*. In either **IE** news program, right-click one or more messages and then select *Mark Message for Download*. The next time that you connect, select *News•Post and Download* in **Internet News**, or *Tools•Synchronize•Get Marked Messages* in **Outlook Express**. Wait for the messages to download, and then disconnect to read them. Offline, the headers with messages attached to them have little pushpin icons.

When you reply to messages offline, they're saved to an out-box. In **Collabra**, compose replies offline and click *Send*. To actually send the replies, select *File•Go Online*, and with *Send Messages* selected, click *Go Online*. In **Internet News** or **Outlook Express**, compose your replies and click the *Post* button. To send them, select *Offline•Post and Download*.

Double Headers When you open a very large newsgroup, save time by limiting the number of messages that download at a time. In N3's **Netscape News**, select *Options•Mail and News Preferences*, and on the *Servers* tab set the *Get xx Messages at a Time* option, where *xx* is a number you enter. To retrieve more messages, select ▶

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- *NEW* Matrox Millennium II 4MB WRAM Video Card
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- Altec Lansing ACS-90 Speakers
- Iomega Zip 100MB IDE Internal Drive with One Cartridge

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- Integrated Yamaha 16-bit Sound
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- Altec Lansing ACS-90 Speakers
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- Altec Lansing ACS-90 Speakers
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- 6.4GB Hard Drive with 512KB Cache (9.5ms)
- *NEW* 1000LS Monitor (15.9" v.i.s.)
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- 2MB EDO ViRGE 3D Video
- Sound Blaster 16 PnP Sound Card
- Altec Lansing ACS-90 Speakers
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Dual Processor Capable, RAID Capable

Common features listed above plus:

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- 2.1GB Hard Drive
- 2nd Lithium Ion Battery
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- ★ *3Com LAN+ 33.6 Modem PC Card, add $349.*
- ★ *Dell Latitude LM Port Replicator, add $159.*
- ★ *Leather Carrying Case, add $129.*

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- 12.1" SVGA Active Matrix Display
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Common features listed above plus:

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- 16MB RAM (72MB Max.)
- *NEW* 1.6GB Hard Drive
- MS Office 97 Small Business Edition
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- ★ *Upgrade to a 2.1GB Hard Drive, add $149.*
- ★ *2nd Lithium Ion Battery, add $199.*
- ★ *Motorola 33.6 Fax Modem, add $169.*
- ★ *Dell Latitude LM Port Replicator, add $159.*
- ★ *Leather Carrying Case, add $129.*

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- 16MB RAM (72MB Max.)
- *NEW* 1.6GB Hard Drive
- Motorola 33.6 Fax Modem
- ★ *Upgrade to 24MB RAM, add $99.*
- ★ *Upgrade to a 2.1GB Hard Drive, add $149.*
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File•Get More Messages. In **Collabra**, select *Edit•Preferences,* and in the Mail & Groups *Groups Server* category set the *Notify me when downloading more than xx messages* option.

In **Internet News**, select *News•Options,* click the *Read* tab, and set the *Download xx headers at a time* option. When you're ready for the next batch, select *News•Get next xx headers.* In **Outlook Express**, select *Tools•News Options,* click the *Read* tab, and set the *Download xx headers at a time* option. To retrieve the next group of messages, select *Tools•Synchronize•Get next xx headers.*

Messages in Threads Sort a newsgroup by thread to keep related messages together. In **Netscape News**, select *View•Sort•Thread Messages.* In **Collabra**, select *View•Sort•by Thread* or click the *Sort by Thread* icon by the column headings. In either IE news program, select *View•Sort By•Group Messages by Thread.*

Communicating One-on-One

Collaborating with someone who lives far away? If you both use the same browser collaboration tool—CoolTalk, Conference, or NetMeeting—you can work together in real time over the Internet.

Speedy Dialing You'll probably want to place the people you call most often on easy-to-use "speed dial" buttons for one-click access. In N3's **CoolTalk**, click the *Start Conference* icon, select an address, and click *Add to Speed Dial.* Type a label for the button, click *Add,* then click *OK* to display the button at the bottom of the CoolTalk window. In Communicator's **Conference** program, select *Speed Dial•Speed Dial 1•Edit* and type in the relevant information. Click *OK,* then click *Show Speed Dial* to display the buttons.

In IE3's **NetMeeting 1.0**, you must actually place the call. Select *Call•Place Advanced Call,* complete the dialog box, making sure that *Add Speed Dial* is selected, then click *Call.* If the call is successful, the address will be preserved.

In IE4's **NetMeeting 2.0**, click the *Speed Dial* button, complete the dialog box, making sure that *Add to Speed Dial List* is checked, then click *Call.*

Unlisted Conferencing Don't want strangers calling you to test their conferencing software? Then keep your name out of public directories. In **CoolTalk**, select *Conference•Options,* go to the *Conference* tab, and deselect *Make me available through server.* In **Conference**, select *Call•Preferences* and on the *Network* tab deselect *List my name in phonebook.*

In **NetMeeting 1.0**, select *Tools•Options,* click the *My Information* tab, and deselect *Publish the information in the User Location Service directory.* In **NetMeeting 2.0**, select *Tools•Options,* click the *Directory* tab, and check *Do not list my name in the directory.*

Hold All Calls You can choose to receive incoming calls automatically, upon your approval, or not at all. To set this option in **CoolTalk**, select *Conference•Options,* and at the *Conference* tab choose an option under *Accept Invitation.* In **Conference**, the various options are on the *Call* menu.

For similar options in either version of **NetMeeting**, select *Tools•Options,* and on the *General* tab select any or all of the options under *Incoming calls.*

Do Not Disturb And what if you don't want to be bothered at all? In **Conference** or either version of **NetMeeting**, select *Call•Do Not Disturb.* This feature is not available in **N3**.

Valerie Ryan is a staff editor for PC World Online. She writes tips and how-to columns for PCW Online and Tip World. ■

aol with your choice of browser

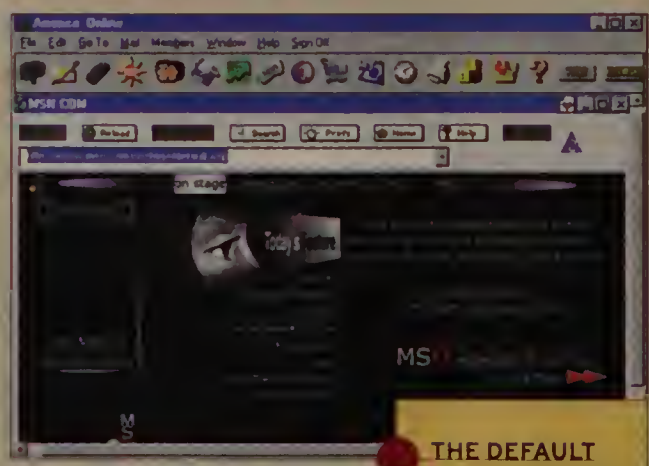
YES, VIRGINIA, YOU CAN use the latest Windows 95 browsers with America Online 3.0. The trick is having the *right* version of AOL 3.0—and it's not the one that comes on those ubiquitous floppies. Here's how to make AOL act like a real Internet provider:

1 Find out what version of AOL you have. Launch AOL and select *Help•About America Online.* You probably have AOL 3.0 for Windows; you want version 3.0 for Windows *95.*

2 Upgrade if you have to. If you don't have the Windows 95 version, log on to AOL and go to the keyword **get95**. There you can download an 11MB file called setup95.exe. When you run the program, it will install the new version.

3 See what you've got. AOL for Windows 95's browser is Internet Explorer 3.0, albeit neatly disguised with a special user interface. For proof, go to the browser and click *Prefs;* you'll get IE's Options menu.

4 Pick your browser. If you're not satisfied with a disguised Internet Explorer, you can use any Win 95 browser with your new version of AOL. In fact, you can use almost any Internet-aware application, even Norton AntiVirus's LiveUpdate. Just log on to AOL, then launch your browser or other Internet program and start using it—no configuration necessary.



THE DEFAULT browser in AOL for Windows 95 is really Internet Explorer 3.0.

5 Know the exceptions. Separate mail readers and newsreaders won't work with AOL. You must use AOL's own software to read e-mail and converse with other users.

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Now, our Millennia line includes models with Fusion 3D™ for those ready to dish up computer entertainment – real entertainment like graphics-laden games or video-packed Internet sites. Our Millennia XRU with Pentium II processors and MME with Pentium processors feature MMX™ technology, 3D video, MPEG and 16X EIDE CD-ROM. These desktops promise speed, performance and easy upgrades.

Or, set a blistering pace with the new Micron Powerdigm™ workstation. The Powerdigm, fueled by dual Pentium Pro processors, works great for graphic design projects, engineering graphics, financial analyses, AutoCad work and more.

Looking for more hot stuff? The Powerdigm comes loaded with a network card and Microsoft® Windows NT® preinstalled–so you're immediately ready to network. And the optional Diamond Fire GL video cards make 3D imaging an affordable reality.

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MICRON ELECTRONICS™

CONFIGURED FOR YOUR LIF

MICRON™ MILLENNIA™ XRU WITH FUSION 3D™

Intel 266MHz Pentium® II processor (features MMX™ technology)
32MB EDO RAM
4GB EIDE hard drive
19" Hitachi SuperScan CM751, .26dp (18" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIOS
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive, 100MB Iomega Zip drive
DVD-ROM drive,* DVD software, E4 Cool DVD PCI decoder card:
6 channel AC-3 to 2 channel out capability,
SPDIF output (digital audio out)
56Kbps technology modem**
Awe 64 sound card
Cambridge SoundWorks/MicroWorks-
2 speaker satellite with subwoofer stereo system
Tool-free minitower or desktop
Popular game titles/Internet multi-player gaming
Microsoft® Intellimouse, 104-key keyboard
Microsoft Windows® 95 and MS® Plus! CD
Microsoft Office 97 SBE CDs
Universal Serial Bus connections
MS Sidewinder Pro joystick
5-yr/3-yr Micron Power℠ limited warranty

$4,199
Bus. lease $143/mo.

MICRON MILLENNIA MME WITH FUSION 3D

Intel 233MHz Pentium processor with MMX
32MB SDRAM
3.1GB EIDE hard drive
17" Micron 17Fcx, .26dp (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound
Advent 370's - speaker/subwoofer system
56Kbps data fax/modem**
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Dffice 97 SBE CDs
Universal Serial Bus connections
Popular game titles/Internet multi-player gaming
MS Sidewinder Pro joystick
5-year/3-year Micron Power
limited warranty

$2,899
Bus. lease $99/mo.

MICRON MILLENNIA XRU

Intel 266MHz Pentium II processor (features MMX)
32MB EDO RAM
5.1GB EIDE hard drive
17" Micron 17FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIDS
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
56Kbps technology modem**
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Dffice 97 SBE CDs
Multimedia Xcitement Pak
(comprised of MMX technology-based software)
Universal Serial Bus connections
5-year/3-year Micron Power limited warranty

$2,899
Bus. lease $99/mo.

MICRON MILLENNIA MME P200

Intel 200MHz Pentium processor with MMX
32MB SDRAM
3.1GB EIDE hard drive
17" Micron 17FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
100MB Iomega Zip drive
16X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
56Kbps technology modem**
PCI 64-bit 3D video, MPEG, 4MB EDO DRAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Dffice 97 SBE CDs
Multimedia Xcitement Pak
(comprised of MMX technology-based software)
Universal Serial Bus connections
5-year/3-year Micron Power limited warranty

$2,299
Bus. lease $78/mo.

MICRON MILLENNIA LXE P166

Intel 166MHz Pentium processor with MMX
16MB EDO RAM
2.1GB EIDE hard drive
15" Micron 15FGx, .28dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
16X EIDE variable speed CD-ROM drive
16-bit stereo sound and speakers
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Mouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Works CD
5-year/3-year Micron Power limited warranty

$1,649
Bus. lease $56/mo.

MICRON POWERDIGM™ XLI

Dual Intel 200MHz Pentium Pro processors
64MB ECC EDD RAM
4GB Ultra-Wide SCSI-3 hard drive
19" Hitachi SuperScan CM751 (18" display) .26dp color monitor
Number Nine Imagine 128 series II video card, 4MB VRAM

STANDARD FEATURES

256KB internal L2 cache, flash BIDS
3.5" floppy drive
Plextor 12/20 Plex variable speed SCSI CD-ROM drive
Memory upgradable to 512MB ECC EDO RAM
Supports multiple Ultra-Wide SCSI-3 hard drives
PCI 32-bit Ultra Wide SCSI-3 controller
Iomega Jaz SCSI drive with 1GB removable cartridge
32 voice wavetable stereo sound with speakers
3Com 3C905 Fast EtherLinkXL 10/100 PCI TPO network adapter
Tool-free minitower
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows NT® Workstation
5-year/3 year Micron Power limited warranty

$5,499
Bus. lease $173/mo.

*The CD-ROM drive will be removed upon the purchase of the DVD upgrade.
**Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and transfer rates may be less than the maximum potentials.

Sweet deals.

MICRON VETIX™ 2MXI

Dual Intel 200MHz Pentium® Pro processors
256MB ECC EDO RAM
Five 4GB Ultra-Wide SCSI-3 hard drives (20GB total)

STANDARD FEATURES

512KB integrated L2 cache
Mylex dual channel Ultra-Wide SCSI-3 RAID caching controller w/4MB ECC RAM
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress™ Pro 100 controller
Integrated SVGA graphics
12x variable speed SCSI CD-ROM drive, 3.5" floppy drive
5 internal, hot-swappable hard drive array bays (upgradable to 10)
3 external 5.25" media bays
1 (one) 330 watt power supply standard (upgradable to 3 for added redundancy)
Microsoft® Mouse, 104-key keyboard
Microsoft Windows NT® Server 4.0 (10-user license)
Intel LANDesk Server Manager 2.52
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power℠ limited warranty
1-year next-business-day on-site service†
NOS Support (3 incident resolutions/1st year), 7x24

$13,499
Bus. lease $424/mo.

MICRON VETIX MXI

Intel 200MHz Pentium Pro processor
128MB ECC EDO RAM
Three 4GB Ultra-Wide SCSI-3 hard drives (12GB total)

STANDARD FEATURES

256KB integrated L2 cache
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12X variable speed SCSI CD-ROM drive
3.5" floppy drive
5 internal, hot-swappable, hard drive array bays (upgradable to 10)
3 external 5.25" media bays
1 (one) 330 watt power supply standard (upgradable to 3 for added redundancy)
Microsoft Mouse, 104-key keyboard
Microsoft Windows NT Server 4.0 (10-user license)
Intel LANDesk Server Manager 2.52
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power limited warranty
1-year next-business-day on-site service†
NOS Support (3 incident resolutions/1st year), 7x24

$7,999
Bus. lease $251/mo.

MICRON TRANSPORT™ XKE

166MHz Mobile Intel Pentium processor with MMX
128MB EDO RAM
5GB removable hard drive
13.3" TFT XGA display

STANDARD FEATURES

Intel 430TX Mobile PCI chip set
512KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator, 2MB DRAM
20X modular CD-ROM drive with AutoPlay™
Pick-a-Point™ dual pointing devices
Sound Blaster 16-bit stereo sound (supports surround sound and wavetable)
Built-in stereo speakers and microphone
Motorola Montana 33.6 fax/modem* w/full telephony duplex phone
CardBus-and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability, built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive, 3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft Windows 95 and MS® Plus! CD
Microsoft Office 97 SBE CDs
5-yr/3-yr Micron Power limited warranty

$5,999
Bus. lease $188/mo.

MICRON TRANSPORT XPE

166MHz Mobile Intel Pentium processor with MMX
32MB EDO RAM (80MB max)
2.1 GB removable hard drive
12.1" active matrix color display, 800x600

STANDARD FEATURES

Intel 430MX Mobile PCI chip set
256KB L2 pipeline burst cache
PCI graphics accelerator, 2MB VRAM
8X modular CD-ROM drive
Pick-a-Point dual pointing devices
Sound Blaster 16-bit stereo sound
Built-in stereo speakers and microphone
Motorola Montana 33.6 fax/modem
CardBus- and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability
Built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive, 3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
5-yr/3-yr Micron Power limited warranty

$4,099
Bus. lease $140/mo.

† On-site service for the Vetix server is provided by Digital Equipment Corporation and is optional.
* Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and obse ed

MICRON VETIX LXI-N

Intel 200MHz Pentium Pro processor
32MB ECC EDO RAM
2GB Ultra Wide SCSI-3 hard drive

STANDARD FEATURES

Dual Pentium Pro ZIF sockets
256KB integrated L2 cache
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12X SCSI-2 CD-ROM drive
3.5" floppy drive
9 drive bays: 6 internal 3.5," 3 external 5.25"
Microsoft Mouse, 104-key keyboard
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power limited warranty
1-year next-business-day on-site service*

$2,999
Bus. lease $102/mo.

MICRON CLIENTPRO™ XLU

Intel 233MHz Pentium II processor (features MMX™ technology)
32MB EDO RAM
2.1 GB SMART EIDE hard drive
17" Micron 17FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB internal L2 secondary cache, DMI support
3.5" floppy drive
16X EIDE variable speed CD-ROM drive
3Com PCI 10/100 ethernet NIC
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Upgradable wavetable audio with speakers
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows NT Workstation
Intel LANDesk Client Manager
5-year/3-year Micron Power limited warranty

$2,649
Bus. lease $90/mo.

MICRON TRANSPORT VLX

133MHz Intel Pentium processor
16MB EDO RAM (40MB max.)
1.4GB hard drive
11.3" SVGA DSTN, 800x600

STANDARD FEATURES

Intel Pentium processor
256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Touchpad pointing device
16-bit stereo sound
Built-in stereo speakers and microphone
2-way infrared port
NiMH battery
Modular floppy drive (flexible bay swappable with CD-ROM)
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

$1,699
Bus. lease $58/mo.

MICRON CLIENTPRO MTE

Intel 166MHz Pentium processor with MMX
16MB EDO RAM
1.6GB SMART EIDE hard drive
15" Micron 15FGx, .28dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS, DMI Support
3.5" floppy drive
3Com 3C905 network adapter
Integrated S3 ViRGE/DX graphics accelerator, 2MB EDO RAM
Integrated wavetable sound
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95
Intel LANDesk Client Manager
5-year/3-year Micron Power limited warranty

$1,599
Bus. lease $54/mo.

*Faster rates may be less than the maximum potentials.

intel inside pentium® PROCESSOR

Appealing options.

MULTIMEDIA OPTIONS

32 voice wavetable stereo sound card	$59[1]
32 voice wavetable stereo sound card with 2MB RAM	$99[1]
Advent AV270 Powered Partners stereo speakers	$79
Advent AV370 Powered Partners stereo speakers with subwoofer	$199
Microsoft® SideWinder 3D Pro joystick	$59
Microsoft SideWinder gamepad	$39

STORAGE/MEDIA OPTIONS

Adaptec 2940U Ultra SCSI Fast-20 controller (upgrade from system with standard Ultra SCSI Fast-20 controller)	$100
Plextor 12/20 Plex 3MB/sec SCSI internal CD-ROM drive (upgrade from system with standard 12X EIDE CD-ROM drive)	$200[2]
Iomega Jaz SCSI drive with 1GB removable cartridge	$299[2]
Iomega ZIP IDE drive with 100MB removable cartridge	$99
Iomega 6-pack of 100MB Zip cartridges	$99
Iomega Ditto 2000 (1/2GB) Travan tape backup drive with tape	$149
Iomega Ditto 3200 (1.6/3.2GB) Travan tape backup drive with tape	$199
Sony 4/8GB SCSI DDS-2 tape backup drive with tape and software	$899[2]
Seagate Backup Exec (for servers)	$249
Mylex dual channel Ultra-Wide SCSI-3 RAID caching controller with 4MB ECC RAM	$899

COMMUNICATION OPTIONS

33.6 internal data/fax modem	$99[3]
33.6 internal data/fax modem, speakerphone, voice mail	$119[4]
33.6 external data/fax modem	$299
56Kbps technology modem**	$99

NETWORKING OPTIONS

3Com 3C509B Etherlink III ISA combo network adapter	$79
3Com 3C900 EtherLinkXL PCI combo network adapter	$99
3Com 3C905 Fast EtherLinkXL 10/100 PCI TPD network adapter	$99
3Com OfficeConnect Hub 8/TPC	$149
3Com OfficeConnect Switch 140	$969

SOFTWARE OPTIONS

EdVenture Pak: Sheila Rae the Brave, Putt-Putt Saves the Zoo, Reader Rabbit's Reading Development Library 1, Freddie Fish and the Case of the Missing Kelp Seeds, and the Thinkin' Things Collections 2*	$69
Quicken Financial Pak: Quicken Deluxe, Quicken Financial Planner, Quicken Parents' Guide to Money, Quicken Family Lawyer*	$69
CorelDRAW 7 (full retail version)	$299
Corel WebMaster Suite (full retail version)	$99
Novell Intranetware 4.11, 5-user license, (for Vetix Lx-e only)	$699

HP PRINTERS

HP DeskJet 692c printer	$319
HP DeskJet 870Cxi printer	$419
HP LaserJet 6P printer	$799
HP LaserJet 6Lxi printer	$429

DISPLAY/VIDEO OPTIONS

17" Hitachi SuperScan CM630 (15.9" display) .26dp color monitor	$150[5]
21" Hitachi SuperScan CM801 (20.0" display) .26dp color monitor	$650[5]
Number Nine Imagine 128 series II video card, 4MB VRAM	$299[6]
Number Nine Imagine 128 series II video card, 8MB VRAM	$549[6]

TRANSPORT OPTIONS

MicronDock™ multimedia port replicator: ethernet 10BT LAN adapter, SCSI-2 port, S-video and NTSC-video output, built-in stereo speakers, infrared port, headphone, microphone, line-in jacks, parallel, serial, VGA and 2 PS/2 ports (with warm dock and built-in game port · available on XPE models only)	$299
Micron™ Executive™ desktop package: matching black 17"monitor (16.0" display), mouse, mousepad and keyboard (can be used with or without MicronDock)	$699
Motorola Montana 33.6 fax/modem supports regular telephone connections, cellular phones and two-way paging devices	$259

DIGITAL CAMERAS

Kodak Digital Science DC20 camera	$199
Kodak Digital Science DC25 camera	$399
Kodak Digital Science DC50 zoom camera	$699

SCANNER OPTIONS

HP Scanjet 5s sheetfed scanner	$269
HP Scanjet 5p flatbed scanner	$399
HP Scanjet 4c flatbed scanner	$799

EXTENDED DESKTOP SERVICE OPTIONS

Optional 1st year on-site service[7] coverage included	
2nd year on-site service[8] coverage (with system purchase)	$79
2nd year on-site service[8] coverage (after system shipment)	$99
2nd and 3rd year on-site service[8] coverage (with system purchase)	$99
2nd and 3rd year on-site service[8] coverage (after system shipment)	$139

EXTENDED NOTEBOOK SERVICE OPTIONS

2nd and 3rd year parts and labor; 3-business-day turnaround for 3 years (with system purchase)	$269
2nd and 3rd year parts and labor; 3-business-day turnaround for 3 years (after system shipment)	$319
2nd and 3rd year parts and labor; 7-business-day turnaround for 3 years (with system purchase)	$209
2nd and 3rd year parts and labor; 7-business-day turnaround for 3 years (after system shipment)	$259

OTHER OPTIONS

APC Per7T surge suppressor	$39
APC Pro7T surge suppressor	$59
APC Smart-UPS 700 with PowerChute plus software	$389
APC Smart-UPS 1000 with PowerChute plus software	$529
Microsoft Natural Keyboard (upgrade from standard keyboard)	$49

[1] Upgrade from systems with standard 16-bit stereo sound card
[2] Requires SCSI host adapter
[3] Modem includes trial memberships to CompuServe and America Online
[4] Modem includes trial memberships to CompuServe and America Online, requires sound card
[5] Upgrade from systems with standard Micron 17" 17FCx color monitor
[6] Upgrade from systems with standard 64-bit 4MB video card
[7] 1st year on-site service is available in the United States and in limited areas in Canada from third-party service provider per customer's agreement with provider
[8] 2nd year and 2nd and 3rd year offerings are available in the United States only
Some options and accessories available with system purchase only

*Available only on desktop and notebook systems with Microsoft Windows 95.
**Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.

Call now to order.

800-249-1176

www.micronpc.com

MICRON POWER℠ WARRANTY

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty (1-year for TransPort VLx)
- 1-, 2- or 3-year optional on-site service agreement for Micron desktop and server systems
- 30 days of free Micron-supplied software support for Micron desktop systems; 3 optional network operating system incident resolutions included for Micron server systems
- 30-day money back policy
- 24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.

Micron Sales Hrs: Mon-Fri, 6 am-10 pm, Sat, 7 am-5 pm (MT) Technical Support Available 24 Hours A Day, 7 Days A Week Toll free from Mexico: 95-800-708-1755 Toll free from Canada: 800-708-1758 · Toll free from Puerto Rico: 800-708-1756 · International Sales: 208-893-8970 · International Fax: 208-893-7393

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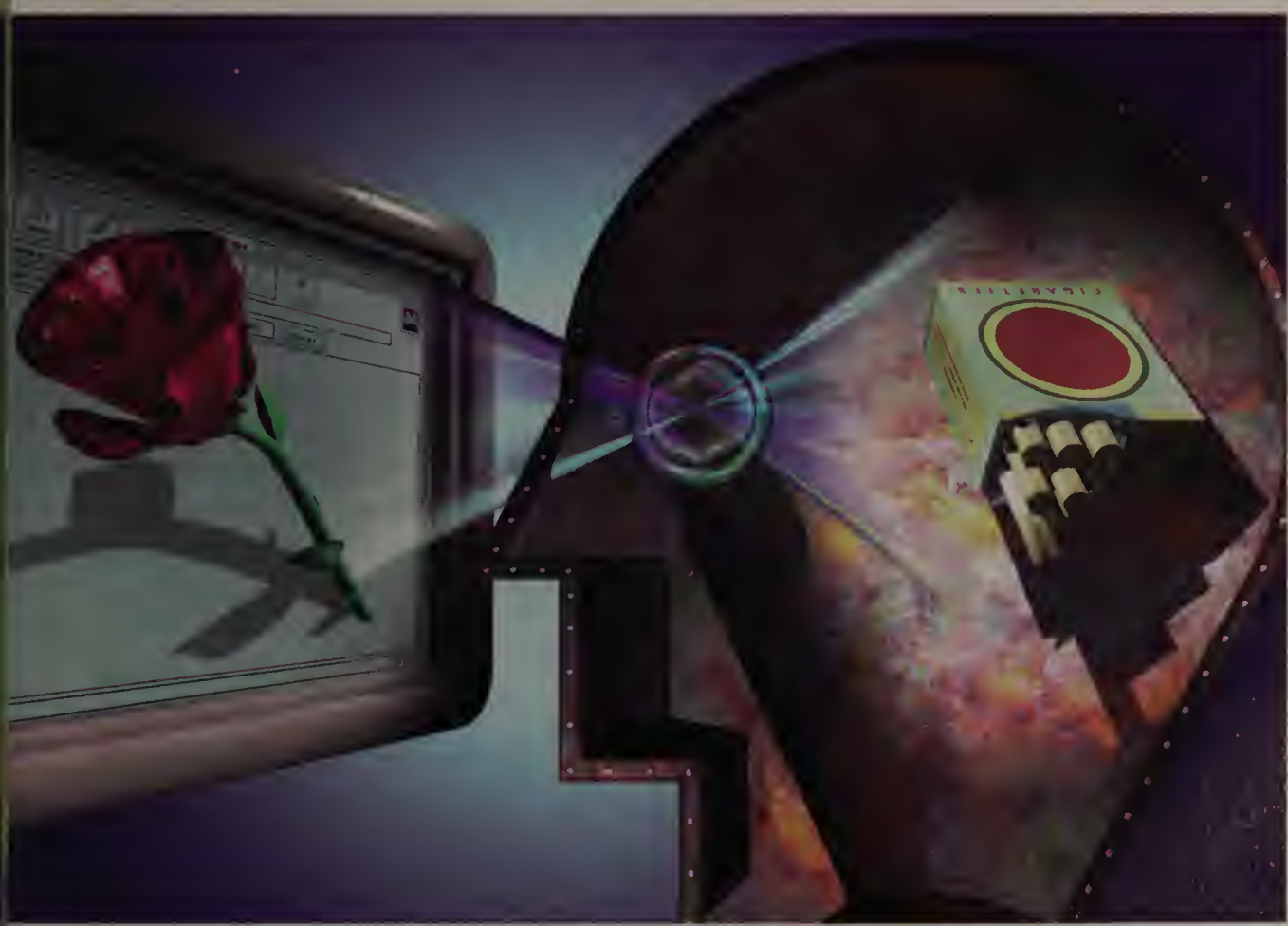
CONFIGURED FOR YOUR LIFE

WEB OF DECEIT

How to separate information from infomercials on the Net.

LAST FEBRUARY a new site opened its doors in a corner of the World Wide Web. The site was called Circuit Breaker (www.circuitbreak.com), and it advertised itself as an entertainment guide for the San Francisco Bay Area. It was hip and colorful—even earned a mention in *USA Today* as a hot site. In reality, it was something more troubling.

Among Circuit Breaker's many links were a few simple interactive games. To play, you had to supply a little information about yourself. Name. (Sure.) E-mail address. (Why not?) Are you 21? (Hmm.) Do you smoke? (Hey, what's going on here?)



ILLUSTRATIONS: JIM LUDTKE

Circuit Breaker turned out to be sponsored by the Brown & Williamson Tobacco Corporation—the company that brings you Lucky Strike cigarettes. Nowhere on the site was this information disclosed. (The company's name is now displayed, but you will find no mention of Lucky Strike.)

The Center for Media Education, a group that monitors unethical practices in cyberspace, threatened to report the site to the Federal Trade Commission. Brown & Williamson officials insisted Circuit Breaker was a legitimate entertainment site, part of a test to see if the company could reach its target audience over the Web. And Web watchers became more convinced than ever of one unnerving fact: The Web ain't what it used to be. ▶

By Fern Schumer Chapman

"The Web started with defense, math, and science people," explains Janice Norton of Hands of Time Animation & Design, interactive advertising specialists in Sherman Oaks, California. "And now marketers have taken over."

And taken over they have. Everywhere you go on the Web, you will find marketers lurking. Some disguise their efforts as innocent entertainment sites. Some are cementing influential partnerships with media groups you trust, the better to sell you their wares. And most are using the unique interactive ability of the Web to gather information about you even as they try to sell you goods and services.

Stealth Marketing

ON THE WEB, WHAT LOOKS like objective information may be anything but. The Web is rife with "stealth sites," which appear to offer unbiased content but are really marketing material in disguise.

Café Herpé (www.cafeherpe.com), for instance, appears merely to provide frank information about a common virus. It has attractive graphics, a quiz that tests knowledge of the subject, links to support groups, even an art gallery of romantic paintings. The gallery page proclaims, "Art must be shared, or it grows stale. Sensing this, we opened Café Herpé, which we designed as an ideal environment to house our collection."

Who, you might ask, is "we"? If you scroll down to the bottom of the home page, you'll find that the site is copyrighted by SmithKline Beecham. To many people, that name means nothing—it's not a household name like Pepsi or Nike. SmithKline Beecham is in fact a pharmaceutical company that makes Famvir, a drug to fight herpes. You can find out all about Famvir if you click on the link that takes you to the Café Herpé Espresso Bar. In short, the site is not just an online version of a coffee shop where you can get information in a relaxed atmosphere—it's a virtual soft-sell product brochure. But you'll be hard-pressed to find any mention that the site's sponsor manufactures the product it's endorsing.

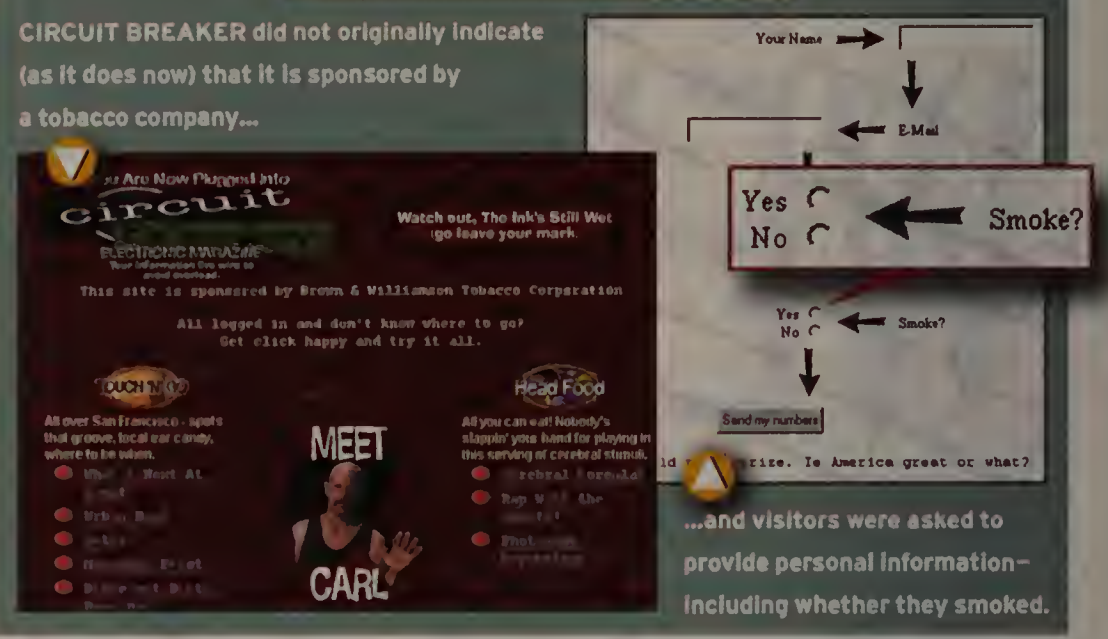
A Word From Our Sponsor

SITES LIKE CIRCUIT BREAKER and Café Herpé are basically the work of single companies. But a more common form of marketing on the Web brings two companies together: the content provider and the marketer—aka the sponsor.

Because media companies find it hard to produce interesting online publications and still turn a profit, many have reached out to advertisers in a way that might be frowned upon in the world of

SMOKE AND MIRRORS

CIRCUIT BREAKER did not originally indicate (as it does now) that it is sponsored by a tobacco company...



...and visitors were asked to provide personal information—including whether they smoked.

getting past the hype

YOU WANT THE BEST information you can get from the Web. But everywhere you go, sites are rife with marketing. Here are a few tips to help you deflect and fight the Web's increasing commercialism.

➤ **Don't believe everything you read.** Your mother said it long ago, and it still holds true. Sometimes it's hard to tell the editorial matter from the marketing pitch.

➤ **Get more than one opinion.** If you read a glowing review, look for other discussion of the same product. On the Web, you can't tell what influences might creep into a review.

➤ **Find sites you trust.** Once you build a relationship with a Web site, you'll have confidence in its information, just as you do with magazines and newspapers.

➤ **Assume your name is for sale.** When you're asked to fill out an online registration form, chances are that information will be used to pitch something to you.

➤ **Don't sell out.** If a site asks you to register, think twice before you sign up. Personal information is a commodity on the Web, so spend it at sites you like. Don't just give it away.

➤ **Know where you're going and where you've been.** If you click on a banner or some other link, you may be transported to an advertiser's site. Before clicking the mouse, hold the cursor over the link and check the status bar. It may tell you where you're heading, so you won't be surprised when you get there.

➤ **See the entire picture.** If a Web site is the creation of a corporate sponsor, it may reveal this fact only at the bottom of the page. So scroll down.

➤ **Blow the whistle.** If you think a Web site has crossed the line between content and advertising without telling its visitors, complain. Send e-mail to the site, to the Federal Trade Commission (consumerline@ftc.gov), or to the Center for Media Education (cme@cme.org).

—Brad Grimes

print. More and more sites are pulling in corporate sponsors to fund their editorial. In some cases, these sponsors are in a business that is directly related to the content they sponsor.

For example, Procter & Gamble recently joined forces with Time Warner to create ParentTime, a site dedicated to parenting issues and advice (found on Pathfinder's site at www.pathfinder.com). As with some stealth sites, the only notice that P&G is involved appears in the fine print. But maybe you're enough of a consumer to recognize that many of the products advertised are from P&G. If readers don't make the connection between ParentTime and its sponsor, they won't realize that the site is also a marketing vehicle for P&G—on the surface it looks like an electronic magazine.

ParentTime articles range from "Taking the Sting Out of Diaper Rash" to "The Magic of Reading," providing an excellent resource for parents. Depending on when you visit ParentTime (ads rotate in and out), you may find a link to P&G's Pampers Parenting Institute near the diaper rash story. At the Institute's site, you can get more information about bringing up baby, plus a directory of P&G's Pampers products.

This kind of marketing marriage isn't necessarily unscrupulous, but it's more than just an online magazine. "The public isn't necessarily aware that one of the major news organizations they trust is partnering with P&G to jointly create editorial content online," says Jeff Chester, executive director of the Center for Media Education.

"Procter & Gamble has no influ- ▶

can you trust your search engine?

IMAGINE YOU'RE SCOURING the Web for information on mutual funds. You go to a search engine, type 'mutual funds', and get a long list of sites that seem to be what you're looking for. You don't have time to scroll through thousands of listings, so you probably pick from the first couple of pages. Now what if you knew that the sites at the top had paid money to be listed first? Would you be confident you were getting the best information?

This scenario seemed implausible until last year, when Open Text (www.opentext.net) began selling preferred placement in its index. In other words, a company that sells mutual funds was given the opportunity to pay a fee to Open Text to ensure that its Web site would jump to the top of the list when users searched for mutual funds. The practice drew sharp criticism, and eventually Open Text ended its preferred-listings program.

Should you be concerned today that search engines are selling preferential placement? Thankfully, no. *PC World* asked an operator of a small Web site to approach the top search engines, including Alta Vista, Excite, Infoseek, Lycos, Open Text, and Yahoo, and ask if he could buy preferred placement for his Web site. None of the companies would sell it to him. Each site flat-out stated that it did not offer such a program. In fact, most sent detailed tutorials on how to design a Web site so search engines could easily identify it, thereby improving its chances of appearing higher in search results.

Lycos representative Sarah Garnsey says that her company "does not and will not adjust relevancy ranking of URLs in a given search." Says Garnsey, "It would violate users' trust in the effectiveness of the service."

But many directories on the Web—sites that organize links into categories based on subject matter—*will* skew their listings for a fee. Some "yellow page" directories sell preferential placement in the same way that printed yellow pages sell large ads. For instance, BigYellow (www.bigyellow.com) includes an extensive alphabetical listing of businesses and services throughout the country. But if you pay $250 per year, BigYellow will make sure that your information always appears at the top of the list.

Debra Aho Williamson, interactive editor at *Advertising Age*, says users need to consider the source when they search for products and companies on the Web. "Online yellow pages aren't much different from regular yellow pages," she says, referring to the selling of special treatment. "But the question is, do people perceive them as paid listings, or do they see them the same way they see search engines?"

William Wise, president of BigYellow, says that users get the picture. "People understand when they come to our site that we're a shopping service. People know we get paid for placement." Sites that pay BigYellow to be at the top of the list are denoted with a gold star, but there's no explanation that these starred companies have paid money for the premium treatment. Whether users actually understand BigYellow's system remains unclear.

The pay-for-position practice is not confined to online yellow pages. Directories like CitySurf (www.citysurf.com), which lists companies alphabetically for a number of U.S. cities, has a "Top 10 Listings" program that puts businesses at the head of the list for a fee, regardless of alphabetical order.

In some cases, a directory might be easier to navigate than an all-encompassing search engine, but users should be aware of the differences between the two. Search engines give you the Web as they find it, while directories often show it to you based on payments from companies.—Brad Grimes

ence over ParentTime's content," says Paula McDonald, director of marketing and sales for ParentTime. According to McDonald, P&G partnered with Time Warner to create a site that would attract potential buyers of P&G products.

To ParentTime's credit, the site doesn't review or recommend products sold by its sponsor. But some Web sites are sponsored by marketers who stand to profit from the reviews appearing there.

Salon Magazine (www.salonmag.com/) is a literary Web site in the spirit of magazines like the *New Yorker*. It covers current events and social issues and reviews books and recordings. The review sections are clearly sponsored by Borders Books & Music, with a line at the top of the page indicating so. In fact, you can click on a link to order a reviewed book or CD—directly from Borders. The link on Salon's review page does not reveal that Borders, the company that makes the site possible, is also the merchant. You won't know that you're ordering from Borders until you go to make a purchase.

This lack of disclosure makes the reviews suspect. But David Talbott, editor and CEO of Salon, insists that the reviews are impartial. "Borders completely appreciates the need for editorial separation," he says.

Do consumers care when the lines between editorial and advertising blur? A Chicago doctor, who asked that his name not be used, says he felt "duped" when he was attracted to a site offering educational materials about infectious diseases. When he visited the site, he discovered that the material was produced by a pharmaceutical company with the purpose of hawking its antibiotics. "When I realized that, I immediately clicked off the site," he says. "[The drug maker's] sponsorship discredited the information," he explains.

JANICE NORTON *Hands of Time Design*
"The Web started with defense, math, and science people. And now marketers have taken over."

You Are Being Watched

ONE OF THE MOST CHILLING aspects of the marketing explosion on the Web, however, is that salespeople are doing more than just disguising ads as editorial so they can hawk products at you. They lure you to their site, and while you're there, they gather detailed information.

Sites like Circuit Breaker can ▶

some cookies aren't yummy

EVEN IF YOU ARM YOURSELF with all the skepticism it takes to separate real information from a sales pitch on the Web, marketing forces you can't see and might never know about are hard at work. *Cookies* are tiny files that Web sites send to your PC—often without your knowledge—to collect information about your online habits.

Cookies aren't necessarily a bad thing: They can help a Web site improve its content by learning what you like or don't like about it. But they can also gather information for marketing purposes: how long you spend on a Web page, what intrigues you enough to click on it, and more.

According to a recent survey by market researcher Cyber Dialogue, 72 percent of Web surfers have never heard of cookies. Of the 28 percent who are aware of them, only half know what they really are. Most of this information gathering goes on without consumers' knowledge or permission.

The Internet Engineering Task Force, which sets standards for the Internet, recently considered a proposal that would make it impossible for Web users to receive a cookie without knowing it. Currently Web browser software can warn you about an incoming cookie, but the default setting lets cookies through without warning. If the IETF's proposal is accepted and browser makers comply with its directives, the default will change. Users will be able to specify which cookies can come through and which will be automatically blocked.

In addition, the proposal seeks to keep third parties, such as advertisers and data collection firms, from sending cookies through Web sites. This would affect companies like DoubleClick, which posts its clients' ads from a central server and also sends cookies to track Web user activities.

Marketers realize that the proposal could seriously hinder their efforts to target advertising, so expect a struggle to ensue over your privacy. As we went to press, the fate of the proposal was uncertain.

In the meantime, you can use software utilities that automatically block all cookies instead of simply warning you each time one arrives. Perhaps the best such utility is the Cookie Crusher, which you can find in the PC World Online Software Library at www.pcworld.com/files. —Brad Grimes

PHOTOGRAPH: GARY MOSS

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Circle 84 on reader service card

obtain information about you instantly by getting you to register. Children surfing the Web are especially susceptible to fun-looking sites that request information about their families for purposes of marketing (see *Consumer Watch*, June). Advertisers can also get a detailed picture of what interests you by gathering data about where you click when you're online. They do this by sending out *cookies*—miniature programs that track your activity (see "Some Cookies Aren't Yummy"). Once they've got this data and your registration information, they can use it to target ads at you or even send junk mail to your house.

This type of information gathering is probably the most common marketing activity on the Web. "The new online business model is based on capturing and controlling the most personal information," says Chester.

Consumers are accustomed to media that is carefully regulated and harmless. And if they assume the Internet is merely an electronic form of other media, offering on a computer screen the same objectivity of, say, newspapers and magazines, they will be easily duped. How would you feel about the magazine you're reading right now if you knew it was taking notes as you turned the pages and reporting back to advertisers?

While many Web sites, such as news sites, remain unbiased, others take advantage of users' assumptions that the Web is just another form of media. They may pretend to be journalistic, or fail to disclose their marketing slant. And few can resist the temptation to gauge how well their marketing efforts are working.

Who's Watching the Watcher?

THE PROBLEM IS, the Web is still new, and regulators are just learning about potential abuses. In the absence of enforceable guidelines, marketers are free to reach out in ways that aren't possible or allowed in print or on television.

Moreover, just about anyone can be a publisher on the Web. In traditional media like magazines and TV, the producer of the publication or show controls the advertisers' access to the audience. The Web has no go-between—advertisers can take their messages directly to the site visitors. When print or television marketers *do* produce their own content—so-called advertorials and infomercials—strict industry guidelines require them to label the material as an ad. But as yet no guidelines for such disclosure are in force on the Web.

Seth Goldstein, whose company, Site-Specific, markets brands on the Web, acknowledges the effect that groups like his are having on Web content. "We're reaching a time when you won't be able to separate what's [editorial] and what's advertising," he says.

Finding Credible Content

THERE'S CERTAINLY nothing criminal about the strategies that companies employ to lure Web surfers, but consumers need to know whether a site's information is objective.

"If users want objectivity, they have to be willing to pay for it," says Cebra Graves, the editor of Morningstar.Net (www.morningstar.net), a site that helps people build and track stock and mutual fund portfolios. If users paid for the information they got on the Web, it could even up the score with marketers. No longer would advertisers be the only source of revenue for groups that want to publish on the Web. But so far, visitors haven't been all that willing to pay subscription fees. According to a study by NetSmart Research, only 8 percent of Web surfers surveyed are willing to pay.

What you may not realize is that you are already paying for much of the material you find on the Web. The currency you use is your own personal information, rather than cash. Essentially, ▶

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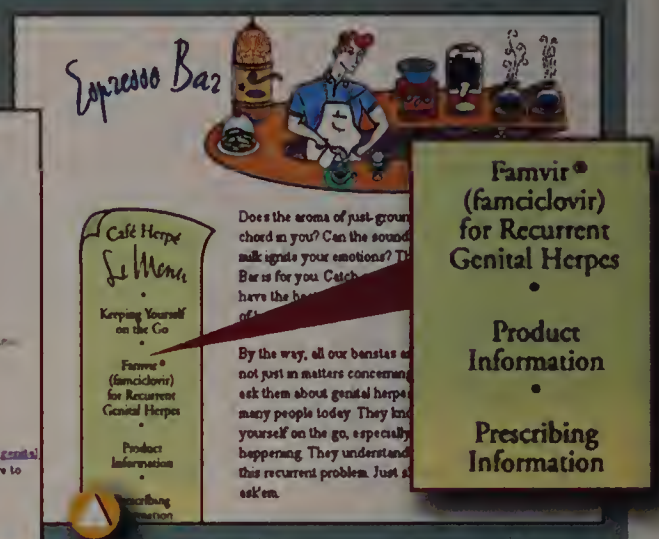

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you pay for the sites that you visit by revealing who you are and what you'll buy.

To keep drawing ad dollars, sites must prove to advertisers that they attract a targeted audience with plenty of disposable income. With cookies in one hand and registration forms in the other, sites try to reel you in and find out about you.

Morningstar.Net has made a concerted effort not to mingle advertising with editorial content, but Graves certainly understands how a site could succumb to the pressures. "The theory," he says, "is that the more we know about you, the more we can target the advertising to you. But it's hard to draw the line between the content provider and someone selling you something."

SETH GOLDSTEIN *SiteSpecific*
"We're reaching a time when you won't be able to separate what's [editorial] and what's advertising."

Regulating the Market

IN FEBRUARY the American Society of Magazine Editors drew up guidelines for Web content. Essentially, the online guidelines invoke the same principles that apply to editorial content, ads, and special advertising sections in print publications. The proposed guidelines state, "It is the responsibility of each online publication to make clear to readers which online content is editorial and which is advertising and to prevent any juxtaposition that gives the impression that editorial material was created for or influenced by advertisers." (Check this month's *Up Front* for news on the ASME guidelines.)

Frank Lalli, president of the ASME board and managing editor of *Money* magazine, says ASME has enforced print guidelines very successfully, and he feels that publishers understand the importance of distinguishing between editorial and advertising. Now, he says, ASME will find out if it can regulate the Web.

"Publications that serve their readers build a loyal audience, and it is that loyal audience that becomes their stock-in-trade," says Lalli.

The FTC says its regulations regarding unfair marketing practices apply to the Web, but so far the agency has turned its attention mainly to flagrant cases of fraud, such as credit repair schemes and pyramid scams. In a speech last March, Commissioner Roscoe B. Starek said regulating online advertising poses unprecedented problems because of the Web's international scope—rules and regulations vary greatly from country to country. "My concern is that once governments begin to regulate or try to enforce their own laws against advertising on the Internet, we may be left with a Net containing only that which violates no country's laws," he said.

The fact is, policing the Web is nearly impossible; no government is staffed or equipped to do the job. Without the security of law and its enforcement on your side, you'll have to take an active role in keeping marketers in check. Always ask questions as you browse. Who published this information? Who is paying for it? Look for disclaimers like "sponsored by." Does knowing who's behind the site affect the way you interpret the information it provides? If you find yourself the subject of slippery marketing tactics, simply leave the site. And you can always refuse to give out personal information. You can also opt to turn away all cookies at the door (see "Browser Secrets").

When you venture into the open market of the Web, you need a healthy sense of consumerism. A magnifying glass for reading the fine print may become your most useful Web browsing tool. Look closely before you answer any questions or buy anything. And keep an eye on your wallet.

Fern Schumer Chapman is a freelance writer based near Chicago. Brad Grimes is a senior associate editor for PC World. *Lewis Perdue, founder of www.webethics.com, contributed to this article.* ■

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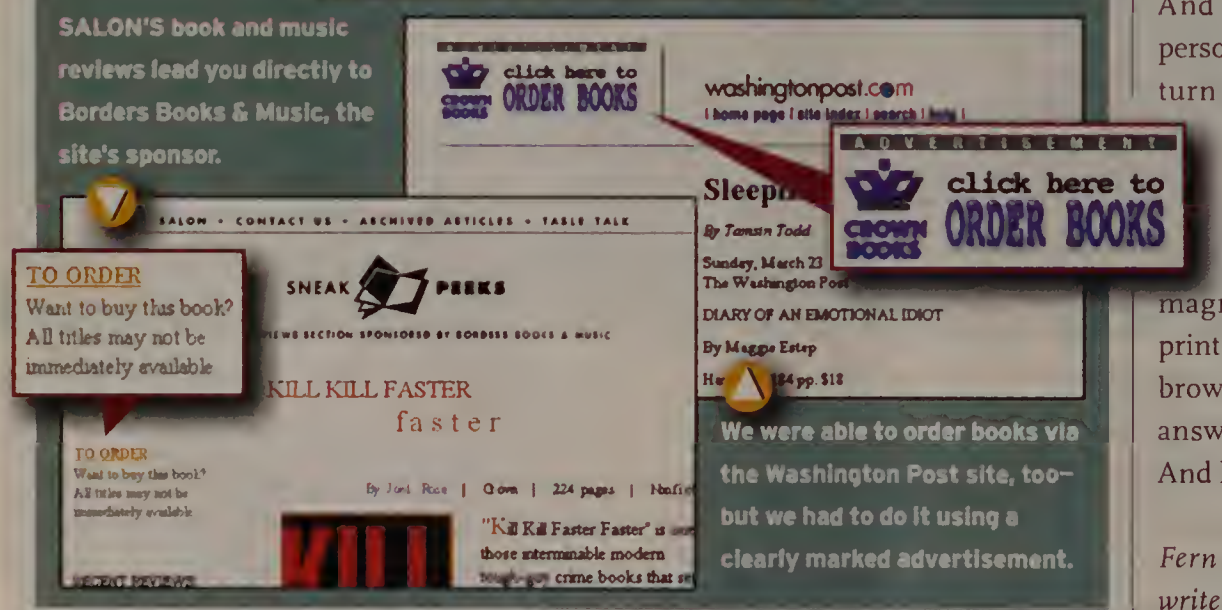

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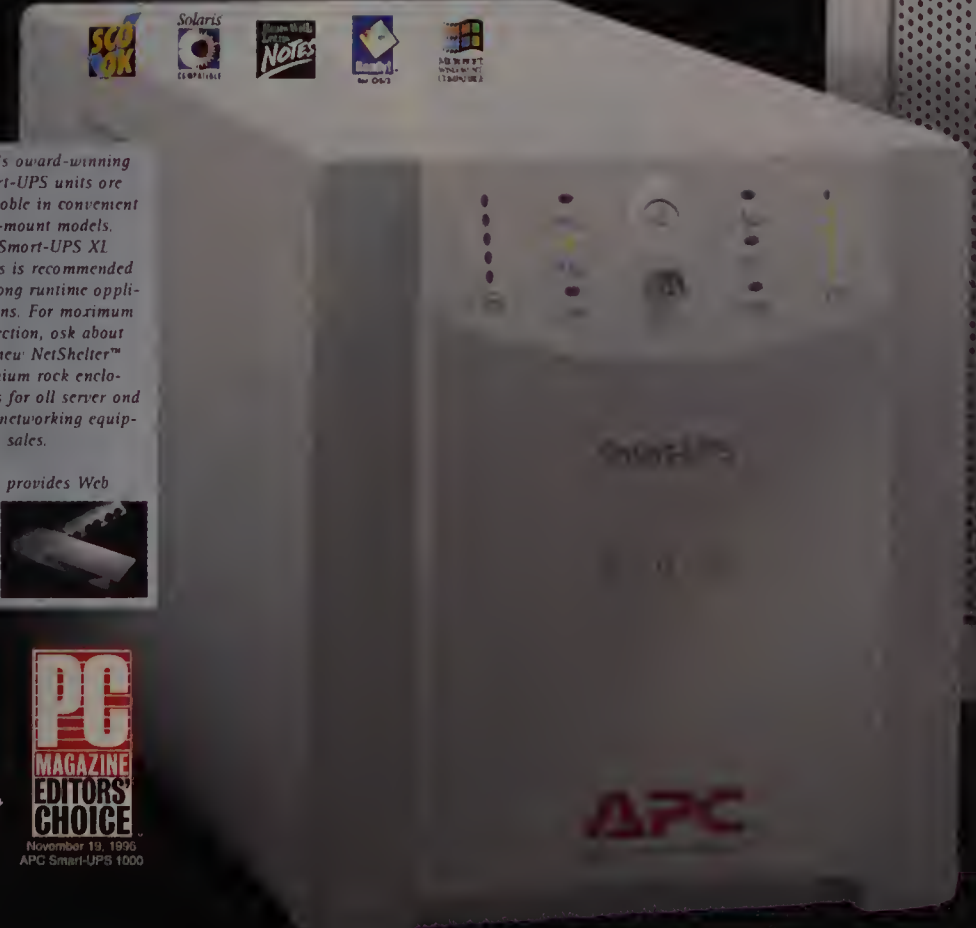

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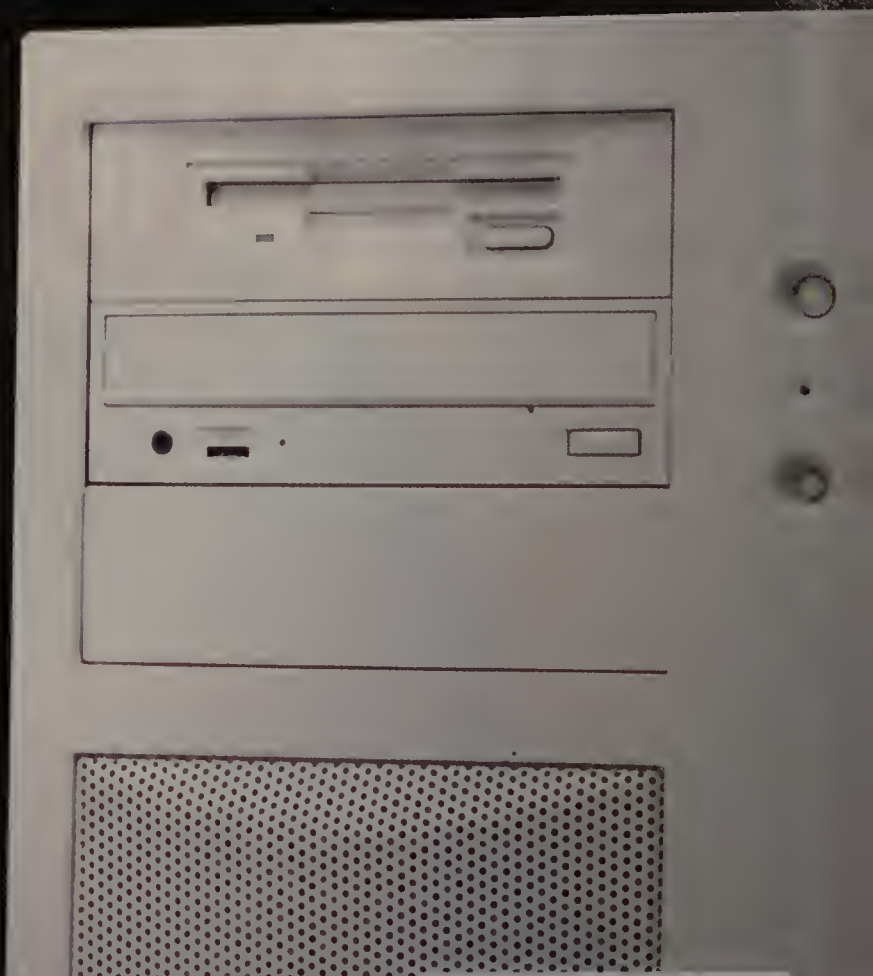

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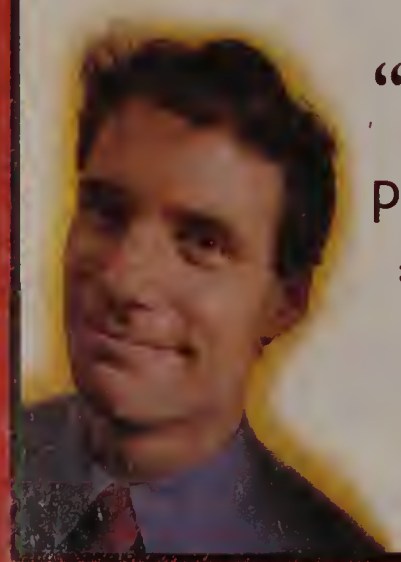

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CDW 86315 **$3049.52**

PC 365
200MHz Pentium Pro
32MB RAM/2.5GB HD
16X CD-ROM
Win NT Workstation
$2614.91 CDW 84735

4.2GB/Matrox
CDW 84737 **$2985.42**

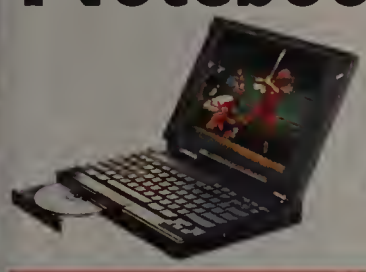
Intellistation Z Pro
200MHz Pentium Pro
32MB RAM/2.1GB HD
16X CD-ROM
Matrox Millennium
$3679.13 CDW 88178

64MB/4.5GB
CDW 88179 **$4449.76**
128MB/4.5GB
CDW 88181 **$7619.68**

All monitors shown sold separately

Aptiva S

Notebooks

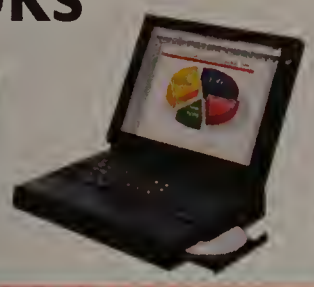


ThinkPad 365X

133MHz Pentium
8MB RAM/1GB HD
optional CD-ROM
11.3" dual-scan display
16-bit sound

$1076.76 CDW 74859

365XD 8MB/1.35GB/6X
CDW 74858 **$2065.84**
365XD 8MB/1.35GB/6X
CDW 81181 **$1569.25**



ThinkPad 380

150MHz Pentium
16MB RAM/1.35GB HD
8X CD-ROM
12.1" dual-scan display
SVGA resolution

$2059.50 CDW 86304

380 16MB/1.08GB
CDW 86302 **$1769.64**
380D 16MB/2.1GB
CDW 86305 **$3345.06**

ThinkPad 560

133MHz Pentium
8MB RAM/2.1GB HD
—
12.1" active-matrix display
4.1 lbs. subnotebook

$3869.45 CDW 81186

560 8MB/810MB
CDW 69376 **$1399.00**
560 8MB/2.1GB
CDW 81184 **$2429.56**
560E 16MB/2.1GB
CDW 89290 **$2699.86**

ThinkPad 760XL

166MHz Pentium MMX
16MB RAM/2.1GB HD
optional CD-ROM
12.1" active-matrix display
SVGA resolution

$4289.78 CDW 84102

760XL 32MB/2.1GB/NT
CDW 84103 **$4488.21**
760XD 32MB/3GB/8X
CDW 84101 **$5089.28**
760ED 16MB/2.1GB/6X
CDW 74862 **$3897.56**

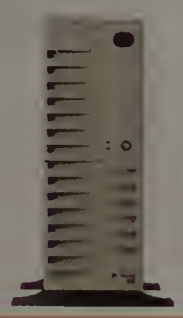
ThinkPad 765L

166MHz Pentium MMX
32MB RAM/3GB HD
optional CD-ROM
13.3" active-matrix display
XGA resolution

$6179.71 CDW 89293

765D 32MB/3GB/8X
CDW 89292 **$6759.22**

Servers



PC Server 310

200MHz Pentium
32MB RAM/2.1GB HD
8X CD-ROM
file and database server

$2449.13 CDW 89307

5/200MHz/no HD
CDW 89306 **$2135.40**

PC Server 315

180MHz Pentium Pro
32MB RAM/2.1GB HD
8X CD-ROM
entry business network server

$2999.28 CDW 89308

6/180MHz/2.1GB HD
CDW 89309 **$2558.95**
6/200MHz/2.1GB HD
CDW 89311 **$2877.79**

PC Server 325

200MHz Pentium Pro
32MB RAM/2.25GB HD
—
mini-tower LAN server

$3944.60 CDW 83521

6/200MHz/no HD
CDW 78653 **$3267.32**
6/200MHz/rack
CDW 86296 **$3588.45**

PC Server 330

200MHz Pentium Pro
32MB RAM/2 x 2.25GB HD
8X CD-ROM
symmetrical multi-processing

$7999.80 CDW 82447

6/200MHz/no HD
CDW 83722 **$4156.66**
6/200MHz/no HD
CDW 82445 **$4639.65**

PC Server 704

200MHz Pentium Pro
128MB RAM /no HD
4X CD-ROM
4-way multiprocessor support

$10,889.56 CDW 78291

6/200MHz/256MB RAM
CDW 89937 **$15,767.83**
6/200MHz/256MB RAM
CDW 89938 **$18,919.31**

ThinkPad 760
shown with optional
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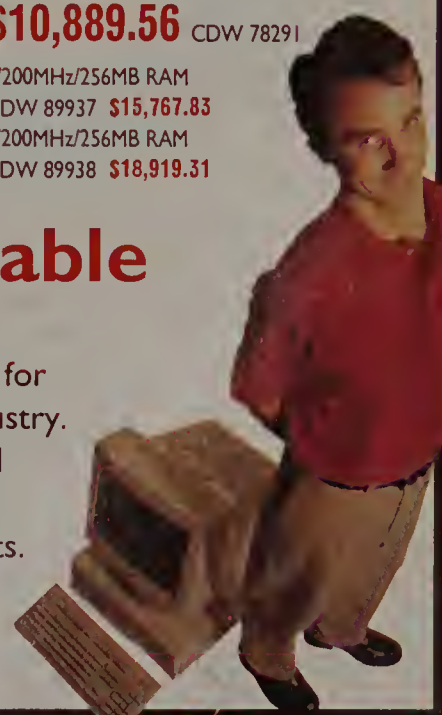

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BANDWIDTH

YOUR SMALL BUSINESS is finally in the black, but your Internet connection is still chugging along, trying to catch up. You remember the fast T1 lines of your corporate days: Despite the fact that they're shared by

The fastest ways to connect, from

on demand

56-kbps modems to satellite hookups.

hundreds of users, T1 lines are almost always very, very fast. They display Web pages in a flash and download multimegabyte files in seconds. You and your modem? Even when you manage to make a 33.6-kbps connection, your online activities seem to take forever. Your data transmission capacity—or *bandwidth*—is just plain slow.

But how do you get up to speed? Several new technologies coming down the pike promise to speed up Net access to 128 kbps, 400 kbps, even 30 *mega*bits per second—fast enough to download the entire text of the *Encyclopaedia Britannica* in less than a minute. We tested five technologies and assessed their suitability for small-business use. Some aren't widely available yet, but don't despair: A fix for your high-bandwidth habit is within reach. ▶

By Scott Spanbauer

T1 and Other Technologies. In case you're wondering, you *don't* want your own T1 line. It's expensive—the equipment costs at least $2000, and the service itself runs at least $300 a month—and you may have to act as your own Internet service provider. That means setting up and managing mail, news, and Web servers.

What are your other options? Plenty—if you're lucky enough to live where they're offered. For this review, we looked at 56-kbps modems; Integrated Services Digital Network terminal adapters; and Asymmetric Digital Subscriber Line, cable, and satellite services. Of these five options, only ISDN terminal adapters and 56-kbps modems—and their related services—are widely available.

ADSL and cable are so new that the only way we could test them was to use a live Internet connection from the vendor's site. We tested the other products over the Net as well, either from the PC World Test Center or from the author's house. For all products, the test procedure was the same: We loaded a Web page, jumped to a link on another page, and uploaded and downloaded five common file types (.doc, .tif, .jpg, .exe, and .zip). Testing over the Net left us at the mercy of variable line conditions and Web traffic, but it still gave a general idea of how much speed each technology offers. (For ranges, see "The Lowdown on High Bandwidth.")

Bandwidth for Today. Our findings? If you want higher speed now and can deal with the cost and complexities of installation, an **ISDN terminal adapter** is probably your best choice for curing the bandwidth blues. These modemlike digital devices are available as either internal cards or external units, just like analog modems. But they offer up to *four times* a 33.6-kbps modem's speed and are three times as fast as a 56-kbps modem—for about the same purchase price of $100 to $300.

> What are your bandwidth options? Plenty—if you're lucky enough to live where they're offered.

But while ISDN is good for, say, the serious telecommuter, it's far from a perfect solution. You'll have to pay the phone company anywhere from $100 to $400 to install an ISDN line. More ISPs are offering ISDN services, but you'll have to check with yours to be sure it's one of them. And depending on where you live and the adapter you buy, ISDN service can still be expensive—and a pain in the neck to set up.

Don't want to deal with installation woes, or wait for other high-bandwidth technologies to arrive in your area? Then consider a **56-kbps modem.** It's a relatively hassle-free and inexpensive way to speed your communications. While 56-kbps modems are a far cry in speed from the other technologies reviewed here, in our tests they achieved download rates that were 34 percent faster than a 33.6-kbps modem's on average. Unfortunately, warring standards make it difficult to choose a 56-kbps modem that won't soon become obsolete.

THE LOWDOWN ON HIGH BANDWIDTH

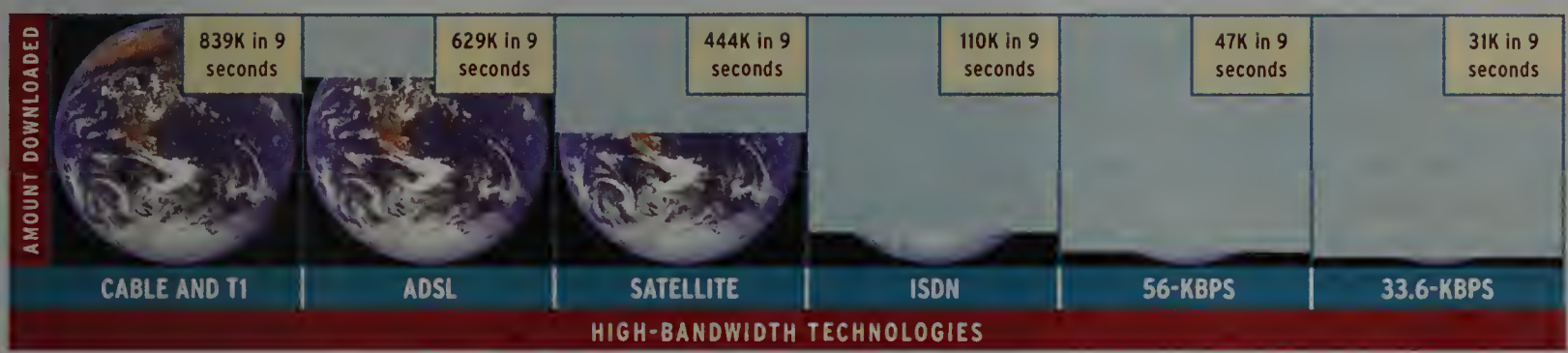
OF THE FIVE HIGH-BANDWIDTH OPTIONS we tested, only ISDN is widely available today; 56-kbps modems are a close second. Satellite, though not widely used, should be relatively easy to set up anywhere. Cable and ADSL are the real wild cards: Each is currently available only in very limited areas. We include the established T1 line technology for comparison.

TECHNOLOGY OPTION	Estimated or projected upload/download speed[1]	Current availability	Estimated cost of hardware/monthly service cost	Suitability	Pros/Cons
56-kbps analog modem	33.6 kbps/53 kbps	Most ISPs and online services support either x2 or K56flex modems, or both	$100-$295/ $10-$25[2]	E-mail, basic Web browsing, small file downloads	Works with regular phone line; may be upgradable from existing modem/Only modest speed gains; competing standards
ISDN terminal adapter	128 kbps/128 kbps	Most urban and suburban areas except New Mexico[3]	$100-$500/ $35-$1000[4]	Power Web browsing, large file downloads, streaming audio/video playback, basic videoconferencing	Widely available; 3 to 4 times analog modem speeds/Costs can be prohibitive; installation can be difficult
ADSL adapter	640 kbps-2 mbps/ 1.5-9 mbps	A handful of cities served by US West; other companies will launch services this fall	$500-$1000/ $50-$200	Power Web browsing, videoconferencing, LAN-to-LAN links, streaming audio/video playback	Very fast; uses regular phone lines/Currently only point-to-point connections are available; upload speed may be limited
Cable modem	300 kbps-10 mbps/ 1.5-30 mbps	Gradually increasing support in urban and suburban areas nationwide	$0-$500/$15-$60	Power Web browsing, streaming audio/video playback, large file downloads	Potentially very fast and cheap/Upload speed may be limited; available only where cable is installed
Satellite system	analog modem speeds/ 400 kbps	Anywhere	$399-$499/ $10 plus 70¢ per MB[5]	Web browsing, streaming audio/video playback, large downloads	Wireless; downloads faster than ISDN/Uploads must go through analog modem
T1 line	1.5 mbps/1.5 mbps	Urban and suburban areas nationwide	$2000-$3000/ $300-$2000	Web server use, ISP hosting, corporate LAN-to-Internet links	Fast uploads and downloads; widely available/ Very expensive; requires data communications expertise

[1] ADSL and cable speeds are projected based on information from different vendors.
[2] Cost of phone line.
[3] The Public Utilities Commission in New Mexico has not approved ISDN service.
[4] Average range for constant use. See www.pcworld.com/aug97/bandwidth for pricing details.
[5] Both measured and unlimited pricing plans are available; doesn't include analog modem cost for uploads.

HOW MUCH CAN YOU DOWNLOAD IN 9 SECONDS?

CABLE MODEMS ARE THE fastest new high-bandwidth technology on the horizon: They're running neck and neck with T1 lines for downloading. Each took only 9 seconds to download an 839K image of the earth; the other technologies didn't perform as well. Here we show what percentage of our image each technology can download in 9 seconds. Even though 33.6-kbps modems aren't a high-bandwidth technology, we've included their results for comparison.



Bandwidth for Tomorrow. ADSL adapters, cable modems, and satellite systems are all much faster than ISDN terminal adapters, but they're fledgling technologies by comparison.

Like ISDN, **ADSL** works over your regular phone lines, but it's a lot faster. Theoretically, ADSL adapters can download data at up to 9 mbps; in practice, however, services will initially top out at about 1.5 mbps, and uploads can be ten times slower than downloads. Speed aside, ADSL does have some drawbacks. For example, it currently acts only as a point-to-point service. In other words, you and your ISP must have dedicated ADSL lines running to the same phone company office.

The **cable** companies are also jumping into the bandwidth fray. Using the same cable wiring that brings you your evening's television entertainment, cable companies will provide a faster, less expensive alternative to ADSL, with possible download speeds of up to 30 mbps. Of course, there is a catch: Cable bandwidth is shared by all users on the system, so there's no guarantee that you will always get the maximum promised throughput rate.

Satellite systems are for people who are desperate for bandwidth—super Web surfers who live so far from civilization that they don't have access to ISDN or other options. Hughes Network Systems' DirecPC is the only end-user satellite system available right now. To deliver information, the DirecPC software intercepts the data coming to you and then forwards it over your satellite. During our testing, we saw one big disadvantage to this option: The satellite system is for downloading only. To upload files or send e-mail, you'll also need a standard modem, a phone line, and an ISP account.

Despite the limitations of each technology, the bandwidth horizon is getting broader and broader. With this multitude of options, there's no doubt that the world will be increasingly well connected. No matter where you live or work, you should be able to satisfy your craving for high-speed Internet access.

ISDN: Here Today, Around Tomorrow

Ever since ISDN became a household acronym, it's had a bad rap. People reported that it was difficult to install, that the phone companies took forever to set up the lines, and that it was expensive. When the new 56-kbps modems began to appear, they stole what little thunder ISDN had mustered.

But despite its problems, ISDN is still the fastest and most widely available technology of the high-bandwidth options here. Increasing numbers of ISPs, including GTE Internet Solutions and EarthLink, as well as online services like CompuServe, are capable of handling ISDN. Once installed properly on your end, the all-digital terminal adapters connect reliably at up to 128 kbps and transfer data at up to 300 kbps with compression.

PICK YOUR ADAPTER The external and internal Best Buys of the ten ISDN adapters we tested are from Zyxel and Diamond.

Healthy competition among ISDN vendors has brought adapter prices down from an average of about $650 in our August 1996 roundup to about $290 for the adapters reviewed this month. ISDN may eventually be replaced by the much faster ADSL or by cable, but for now it's a pretty good deal.

The ten ISDN terminal adapters we reviewed included three internal models and seven externals ranging in price ▶

from about $100 to $400. Based on installation, configuration, and performance, our Best Buy internal adapter is Diamond's Supra NetCommander. It offers easy installation and configuration along with near-top performance for a moderate $250. Our Best Buy external adapter is Zyxel's $249 omni.net. Like the NetCommander, the omni.net speeds data across the wires, installs in a jiffy, and simplifies sharing ISDN with analog phones and fax devices.

Of the remaining internal adapters, 3Com's $249 U.S. Robotics Sportster ISDN 128K runs a close second to the NetCommander. But if you're using this terminal adapter, your phone won't ring if it's hooked up through your ISDN line. You can get an add-on device to generate the ring, but it will cost an extra $59. At only $99, Tiger Jet's PCI ISDN adapter is tempting but very basic—it has no analog ports, and its performance is mediocre.

Among external adapters, the Hayes Accura ISDN is practically identical to the omni.net and almost as good a buy. It has the same design, software, and controls but costs a little more—$279. 3Com's U.S. Robotics Courier I-Modem is fast and includes a built-in 56-kbps analog modem, but it has only one POTS (plain old telephone service) port for other analog devices, and at $370 is

pricey. Although the $249 3Com Impact IQ is economical, it's plagued by buggy firmware and middling speed. The performance and features of Adtran's Express XRT are decent but don't justify its relatively high $369 price. 3Com's $260 U.S. Robotics DataBurst ISDN 128K is very fast but doesn't support analog devices at all—which means you'll have to keep a regular phone line for voice calls. The aging $399 Motorola BitSurfr Pro is both costly and slow. (In mid-April—too late for this review—Motorola introduced a new model, the BitSurfr Pro EZ, that should solve some of the problems we saw in the old BitSurfr Pro.)

Internal versus External Adapters.

Which should you buy—an internal or external ISDN adapter? Both have serious trade-offs that you'll want to think about.

The big downside to internal adapters is that they provide fewer analog telephone ports than do most external units. So with an internal, you may not be able to attach a phone and a fax machine that use separate numbers. And because internals receive power from your PC, attached analog devices don't work when the computer is turned off.

But the installation problems we ran into with external models had us muttering for hours. ISDN can send and receive

ISDN TERMINAL ADAPTERS — FEATURES COMPARISON

	INTERNAL ADAPTERS	Street price	Interface	Number of RJ-11 analog ports	Number of analog devices capable of ringing	Caller ID support	Automatic B-channel allocation	Incoming-call bumping	Warranty (years)	Weekday phone support (hours)
1	Diamond Supra NetCommander 800/727-8772 www.diamondmm.com	$250	ISA	1	3	●	●	●	5	14
2	U.S. Robotics Sportster ISDN 128K 800/877-2677 www.3com.com	$249	ISA	1	1 [2]	○	●	●	5	10
3	Tiger Jet PCI ISDN 408/725-7506 www.tigerjet.com	$99	PCI	0	0	○	○	○	5	9
	EXTERNAL ADAPTERS									
1	Zyxel omni.net 800/255-4101 www.zyxel.com	$249	460K serial	2	2	●	●	●	2	9
2	Hayes Accura ISDN 800/374-8388 www.hayes.com	$279	460K serial	2	6	●	●	●	2	10
3	U.S. Robotics Courier I-Modem 800/877-2677 www.3com.com	$370 [3]	230K serial, ISA	1	5	●	●	●	5	10
4	3Com Impact IQ 800/638-3266 www.3com.com	$249	230K serial	2	6	●	●	●	5	24
5	Adtran Express XRT 800/923-8726 www.adtran.com	$369	230K serial	2	6	●	○ [4]	●	5	24
6	U.S. Robotics DataBurst ISDN 128K 800/877-2677 www.3com.com	$260	parallel	0	0	○	●	○	5	10
7	Motorola BitSurfr Pro 800/365-6394 www.mot.com/mims/isg	$399 [5]	115K serial, ISA	2	4	●	●	●	5	16

Best Buy ● Yes ○ No

[1] Prices for external units do not include cost of a high-speed serial interface board.
[2] With $59 external ring generator.
[3] Internal version available for $315.
[4] Will allocate B channel for analog use.
[5] Internal version available for $389.

data at up to 300 kbps with compression. Internal adapters, which connect directly to your PC's ISA or PCI bus, have no trouble performing at this top speed. With an external adapter, however, you'll face two potential performance drawbacks, each of which leads to its own installation woes. First, some ISDN adapters have slow serial ports. You may have to go through additional hassles to set the port speed, depending on your hardware.

Second, most PC serial ports that external ISDN adapters connect to also have speed limitations. If your PC's serial port is the bottleneck, you'll have to install an optional high-speed serial interface board that allows speeds as fast as 460 kbps. These boards, like the Boca Research I/O 650 that we used, cost about $50. You'll also have to open the computer to install the board, negating much of the external device's setup convenience. In addition, these interface boards can be daunting to configure, sometimes requiring hours of frustrating trial and error.

Overall, we recommend going with an internal ISDN adapter if you want the simplest installation process. If you prefer goodies such as status lights, an on/off switch, and continuous power to your connected analog devices, an external unit is your best bet.

Weekend phone support (Sat./Sun.)	Repair turnaround time (days)	Reader service number
●/○	2	731
○/○	7	732
○/○	7	733
○/○	5	734
○/○	3	735
○/○	7	736
●/●	1	737
●/●	10	738
○/○	7	739
●/●	14	740
		All products: 911

taking ISDN step by step

ISDN IS STILL far from a plug-and-play technology. Is it worth the frustration? Price may be the determining factor for you: Depending on where you live and how much you plan to use it, an ISDN line can cost as little as about $35 per month for unlimited usage or as much as hundreds of dollars.

If you do decide to spring for ISDN, the steps below give you an idea of what it will take to get your connection working. For more detailed setup information and for a table that gives you ISDN pricing in your state, check out PC World Online (www.pcworld.com/aug97/bandwidth).

1. Buy the terminal adapter first...
2. ...then order your ISDN line from the phone company (not vice versa).
3. Install a high-speed serial interface board (for external adapters only).
4. Install the terminal adapter.
5. Configure the adapter to work with your ISDN line.
6. Set up the multilink point-to-point protocol.
7. Set the adapter's port to its top speed (for external adapters only).
8. Configure your Dial-Up Networking connection. *—S.S.*

Two B or Not Two B? To achieve the top ISDN connection rate of 128 kbps, all of the terminal adapters we tested support the multilink point-to-point protocol. This simply means they use two 64-kbps B ("bearer") channels, either independently for voice, data, and fax calls, or linked together into one wide 128-kbps digital connection. Each B channel gets its own analog phone number, so you can connect two separate devices—a phone and a fax machine, for example. (Eight of the ten adapters we tested have such POTS ports for analog connections.) If one of the two B channels is needed to answer a voice call or send a fax, the adapter simply yanks a B channel from the data connection, dropping it to 64 kbps. If you're currently paying for a second dedicated data or fax line in your home or office, one ISDN line can replace both of your existing POTS lines.

Linking your adapter's two B channels doubles the speed of the connection, but there are two reasons you may not want to do this. First, if your ISDN provider charges by the B channel, a 128-kbps connection could get expensive. What's more, one B channel usually provides more than enough speed for activities like basic Web surfing. Even streaming video and audio require less than 64 kbps and so may not look or sound any better over a two-B-channel connection.

The best ISDN adapters give you precise control over B-channel allocation. All of the adapters we reviewed, except Adtran's Express XRT and the Tiger Jet PCI ISDN, give you the option of connecting at 64 kbps and then adding or dropping the second channel.

If you've attached an analog phone or fax device to your ISDN adapter, you may want incoming calls to override one, both, or neither of the B channels. Each of the eight adapters with POTS ports supports this incoming-call bumping and automatically allocates a B channel when you make an analog phone or fax call.

The ISDN Bottom Line. If you need speed for both sending and receiving data—and you don't want to wait—ISDN is definitely your best option. The service is now more widely available than ever, if not always cheap. Although other technologies like ADSL and cable are faster, those services may not be available in your area for years to come. ▶

56-kbps Modems

Need speed, but short on cash? Modem makers tout the new 56-kbps analog modems as a quick, inexpensive way to double your download speed. Don't believe it.

That's not to say that a 56-kbps modem isn't worth your upgrade dollar. It's as easy to install and configure as a regular modem and works over your existing telephone line. In addition, many manufacturers—like Hayes—have trade-in programs so that you can upgrade your older, slower modem to the 56-kbps variety.

How much faster will you go with 56-kbps? It's not T1, but you'll get a nice little boost in speed. On average, the four 56-kbps modems we tested were about 50 percent faster for downloads than a 28.8-kbps U.S. Robotics Sportster and 34 percent faster than a 33.6-kbps Sportster. (For more information on individual 56-kbps modems, see "33.6 and Getting Faster," July.)

DOUBLE STANDARDS With the competing x2 and K56flex specs, it's difficult to choose a 56-kbps modem.

But as with all of the other technologies, this one is not problem-free. First of all, 56-kbps modems don't *really* perform at 56 kbps. They can achieve a download speed of only 53 kbps; upload speed is limited to 33.6 kbps, although future standards may improve that performance.

The other problem with 56-kbps modems is that two competing specifications have emerged. The only reason your current modem can connect to another modem—whether at America Online, your ISP, or your office—is that both units conform to a standard such as V.34, which allows 28.8- and 33.6-kbps modems from different manufacturers to work together reliably. Unfortunately, the organization that considers these things, the International Telecommunication Union, may not agree on a single 56-kbps standard until next year.

In the meantime, you'll have to choose between two incompatible de facto standards: U.S. Robotics' x2, and K56flex, which was developed jointly by Lucent Technologies and Rockwell.

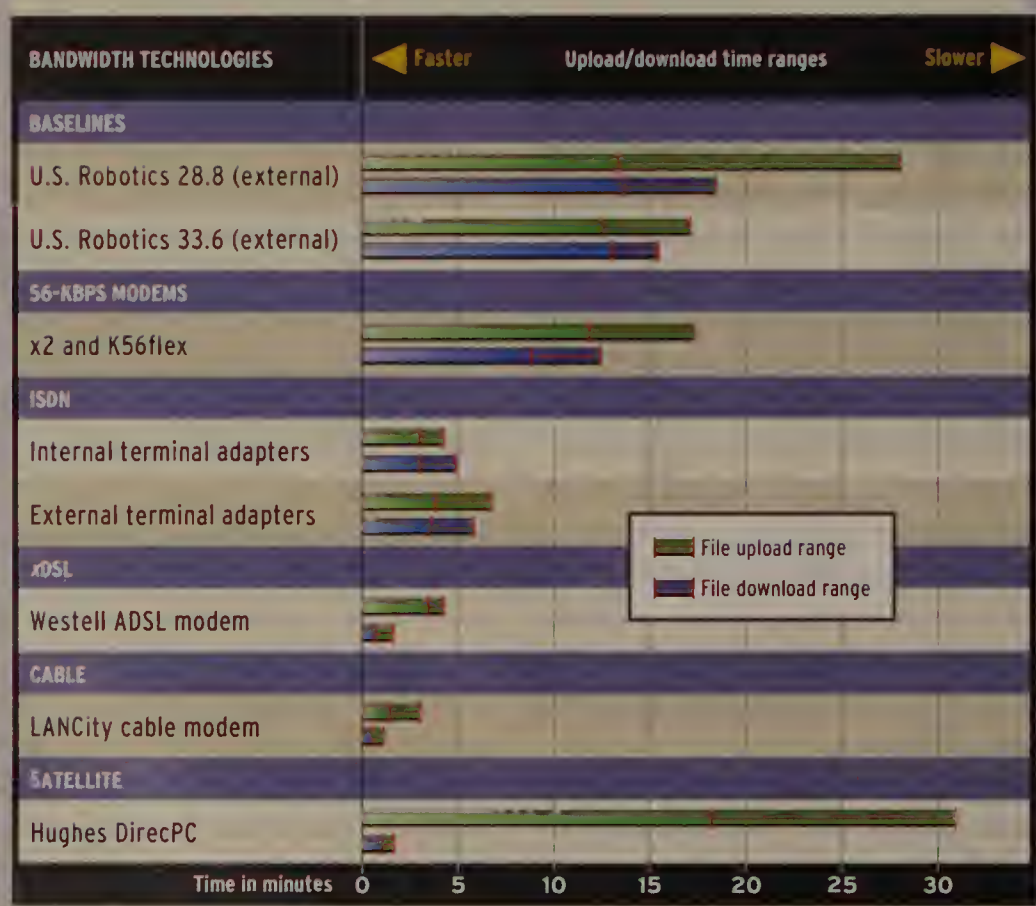
Your safest bet is to purchase a model that's compatible with what your ISP or other primary dial-in sites use. Though some services like Prodigy already provide both K56flex- and x2-compatible access numbers, others may choose to settle on one spec. Both U.S. Robotics (x2.usr.com/connectnow) and Rockwell (www.nb.rockwell.com/mcd/K56/isps.html) maintain updated lists of online services and ISPs that use their respective 56-kbps technologies.

When shopping for a 56-kbps modem, it's equally important to purchase one that's software-upgradable. Buying a modem equipped with programmable chips doesn't guarantee you'll be able to upgrade it to V.*whatever* next year, but you definitely can't upgrade a modem that has read-only chips. Before you buy, be sure to ask the manufacturer about upgrading down the road. ▶

TEST REPORT

Bandwidth Compared

Range of longest and shortest transfer times.



HOW WE TEST We tested four 56-kbps modems, ten ISDN terminal adapters, one ADSL adapter, one cable modem, and one satellite dish. We uploaded and downloaded each of the following five files six times: a .doc file (611K), a .tif file (839K), a .jpg file, an .exe file (452K), and a .zip file (916K). We show the times to transfer all five files.

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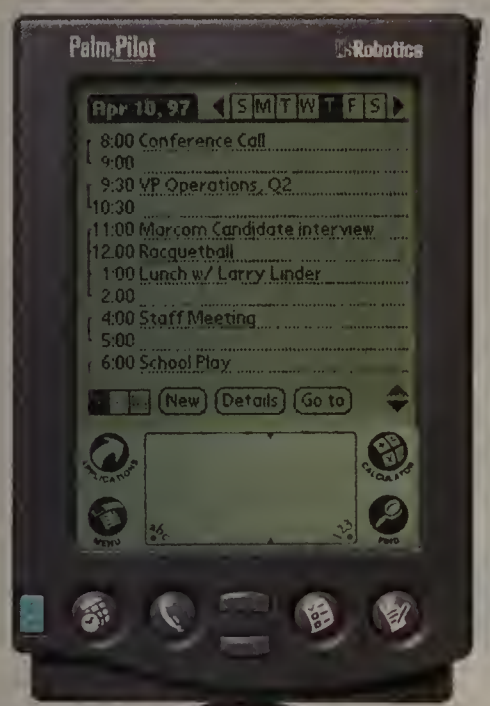

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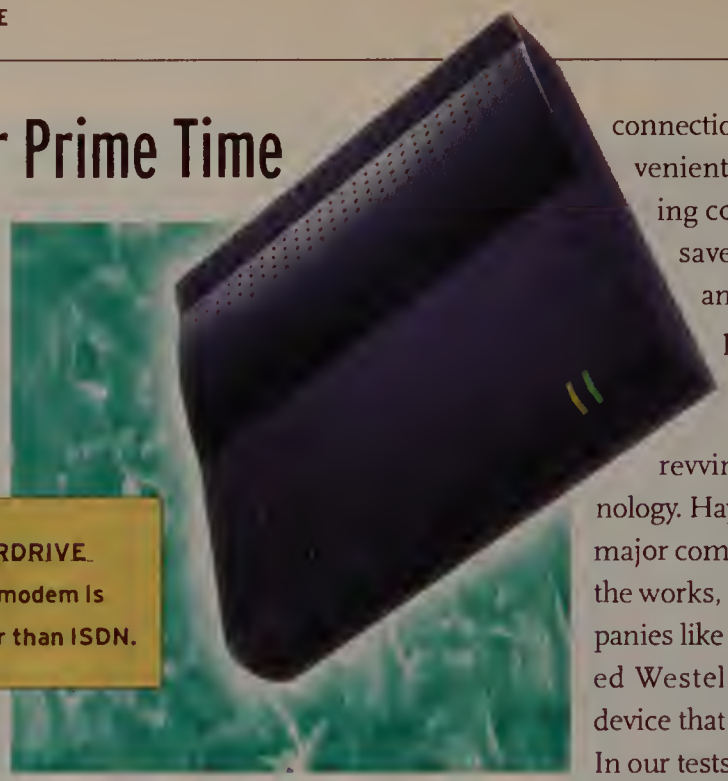
Circle 171 on reader service card

ADSL: Nearly Ready for Prime Time

If all you know is 28.8 kbps or 33.6 kbps, a 56-kbps modem or an ISDN connection may look pretty good. But these technologies are far from the last word in high-speed communications.

Asymmetric Digital Subscriber Line links are the next big thing on the bandwidth horizon: Download speeds can be 1.5 mbps or better. That makes it potentially more than ten times speedier than ISDN.



ADSL OVERDRIVE This ADSL modem is much faster than ISDN.

For now, though, ADSL is just a twinkle in your phone company's eye. Pacific Bell, Bell Atlantic, and other regional Bell operating companies are conducting ADSL tests around the country, but you still can't order an ADSL line unless you live in one of the 14 cities served by US West's fledgling commercial service.

And even when ADSL becomes widely available—at prices predicted to be competitive with ISDN's—it will have some drawbacks. Its maximum upload speed could top out at 640 kbps, significantly slower than its download speed (accounting for the "Asymmetric" moniker). This imbalance shouldn't matter to Web surfers and telecommuters, who will be satisfied with ADSL's near-instant downloads and merely lightning-fast uploads. But for companies with the money and the technical expertise, ADSL doesn't make any sense as a replacement for T1, which offers 1.5-mbps speeds for both uploads and downloads. Still, by the time ADSL becomes a product that consumers can buy, it may be supplanted by a similar technology like Rate Adaptive DSL, which offers symmetric download and upload rates and even higher throughput.

Another issue is that ADSL currently operates only as a dedicated connection from your computer to an ADSL adapter that your ISP or online service installs in the phone company's central office. In other words, you won't be able to make ADSL connections to anyone else over the public switched network, as you can with an ISDN line or an analog modem.

And what ADSL will cost is anybody's guess. Based on the gouging that ISDN users have had to endure, ADSL may be beyond the average infonaut's reach for years to come. US West's ADSL service costs $175 per month, which is reasonable for a small business but may be too pricey for a home office. As for installation, all we know now is that you'll have to install a network card in your PC before connecting an ADSL device.

Nevertheless, ADSL's prospects look good. It promises to be a cost-effective way for telecommuters to make fast Net connections, and it should be fairly convenient to use. It runs through existing copper wires and, unlike ISDN, saves a dedicated channel for your analog phone line. So when the power goes out, the phone should still work.

Modem manufacturers are revving up for the new ADSL technology. Hayes, Motorola, 3Com, and other major companies have ADSL products in the works, as do some lesser-known companies like NetSpeed and Westell. We tested Westell's FlexCap2, a black plastic device that looks like an oversize modem. In our tests at Pacific Bell's ADSL labs, the FlexCap2 achieved a maximum download speed of 586 kbps—significantly faster than ISDN.

Although ADSL and other *x*DSL technologies may be scarce now, the market research firm Dataquest predicts that they are about to explode, and that up to 2 million users will be hooked up by 2000. But it's still too soon to tell which type of DSL will win out, and whether the telephone companies will price it within the reach of average consumers.

HBO, MTV...and WWW?

ISDN may be fast and ADSL even faster, but—in theory, at least—cable is the quickest of them all. A cable modem that connects your PC through a network card has the capacity to download data at up to 30 mbps, more than twice as fast as ADSL. We tested one cable modem—a black metal unit from LANCity with Mohawk-like fins on top—at @Home, an Internet service provider that works with cable company TCI in Fremont, California.

FUNKY AND FAST With downloads as fast as a T1 line's, cable modems like this one lead the high-bandwidth pack.

The fastest download speed we saw? About 1.5 mbps—the same as a T1 line, still plenty fast for most users. Uploads were significantly slower (but still relatively fast) at 820 kbps.

Despite cable's theoretical maximum, the cable companies we've talked to will probably limit speeds to these lower ranges. And cable could be slower still in actual practice. Unlike ADSL and ISDN, which provide a dedicated line from your computer to your ISP, your local cable system is shared among all users. So if every- ▶

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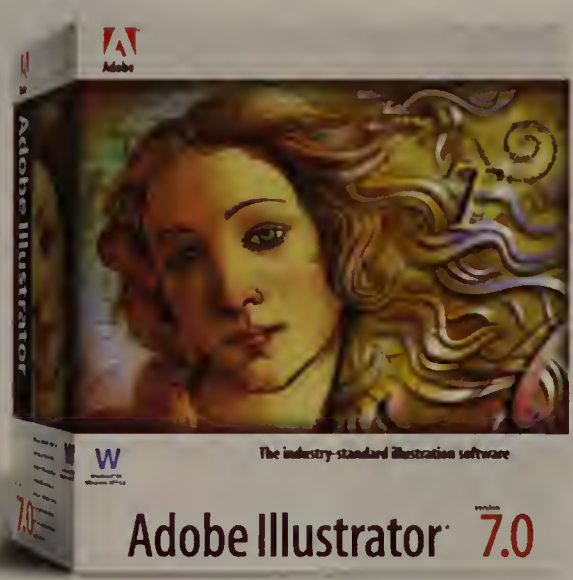

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Circle 32 on reader service card

one in your neighborhood is Web surfing at the same time, you'll all take a bandwidth hit. (Cable companies reserve a separate part of the line for television, so TV watchers won't affect your speeds.)

Also, if you sign up for a cable modem, the cable company may act as your link to the Internet. If your cable provider doesn't give you all the services (such as e-mail) that come with most Internet accounts, you'll have to get them from a separate ISP, adding to your monthly costs. And each cable company will decide what services they will offer.

> With cable, if everyone in your neighborhood is Web surfing at the same time, you'll take a bandwidth hit.

But if cable providers follow in Continental CableVision's footsteps, you will be a happy mouse potato. Although the nationwide system's MediaOne Express (www.mediaone.com) provides cable Internet service in only a few areas like Boston and Detroit, the offer is still a good one: Subscribers get unlimited 1.5-mbps download and 300-kbps upload speeds, all the usual Internet services, and in some areas a free cable modem and installation—all for about $50 to $60 per month.

@Home's service (www.athome.net), available in areas including Seattle, Phoenix, and Baltimore, costs between $35 and $50 a month and provides a modem, an ethernet card, and e-mail service (installation costs extra). And Time Warner's RoadRunner service (www.rdrun.com) is being offered in areas like San Diego; Columbus, Ohio; and Albany, New York.

Overall, there's no way of knowing when—and whether—cable companies will make these services more widely available in a given area.

One thing is fairly certain: Cable will probably never replace the phone company in the hearts of businesses that need high-speed connections. All companies have phone lines, but few have cable. Most U.S. consumers, on the other hand, regularly tune in to CNN and other cable TV channels. If cable providers can beat the telephone companies at the price game, a nation of couch potatoes could soon be surfing the Web at one of the highest bandwidths yet.

Satellite: Look Ma, No Wires

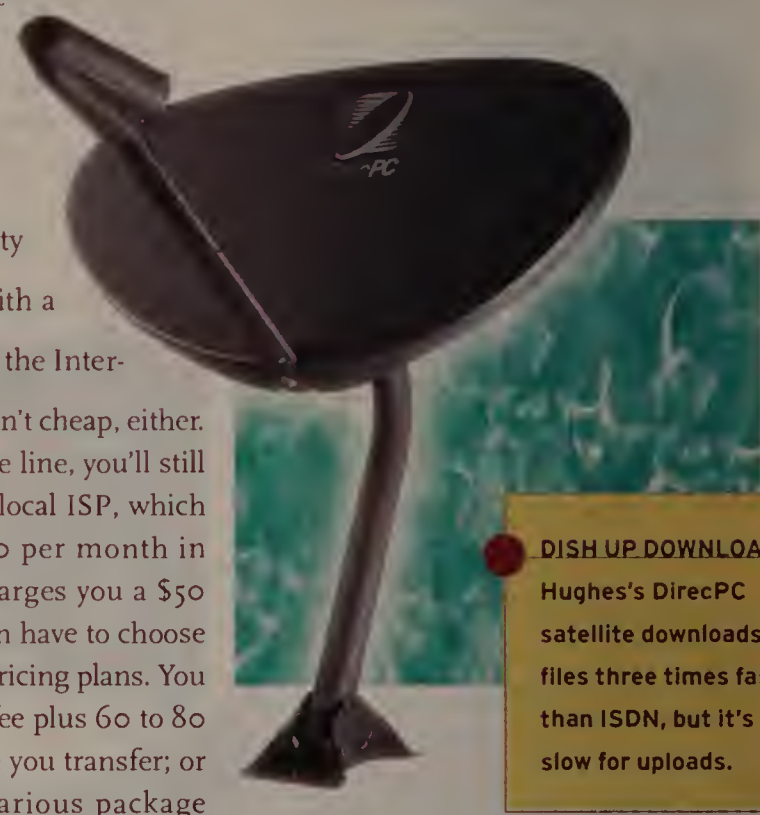
Feel like the Henry David Thoreau of computing? It can get pretty lonely out there, holed up in your mountain cabin, armed only with a copy of Herodotus, a plain table and chair, and a PC. But that's what the Internet is for—to help you reach out and connect every now and then.

But your chances of receiving ISDN, ADSL, or cable services out in the sticks are slim, and you'll also have a tough time getting a phone line capable of 56-kbps (well, 53-kbps) speeds. With satellite, however, you can connect to the Net wherever you live.

Hughes Network Systems' DirecPC is a combination ISA adapter and satellite dish that gives you high-speed access where no ISP has gone before. Although fast, the technology is a compromise: In our tests, the dish provided download speeds of up to 488 kbps—about three times faster than ISDN—but speeds varied widely. Worse, uploads had to be done by modem to a local ISP. The result? DirecPC is great for most Web surfing and for receiving streaming audio and video, but it's dog-slow for file uploads: In our tests, the upload rate was as poky as 16.6 kbps—slower than a 28.8-kbps modem connection.

The DirecPC service isn't cheap, either. Besides an analog phone line, you'll still need an account with a local ISP, which costs about $20 to $50 per month in most areas. Hughes charges you a $50 setup fee, and you'll then have to choose from a variety of usage pricing plans. You can pay a $10 monthly fee plus 60 to 80 cents for each megabyte you transfer; or you can select from various package deals, all of which cost less than $130 a month but limit the time of day you can use the service.

While you have your checkbook out, get ready to cough up about $500 for the DirecPC satellite dish itself. (Many retailers have an instant $100 rebate, so your actual cost may be lower.) The roughly 2-by-3-foot saucer must first be bolted to a roof or an exterior wall, then precisely aligned with Hughes's satellite using both a handheld compass (provided in the kit) and the installation software, which gives you the proper coordinates based on your location.



DISH UP DOWNLOADS Hughes's DirecPC satellite downloads files three times faster than ISDN, but it's slow for uploads.

If Hughes can increase upload speeds and iron out the download glitches, DirecPC could be a viable alternative to ADSL or ISDN. Meanwhile, if you can't get those services where you live, satellite is a fast but pricey link to the Net.

online *For additional information about high-bandwidth technologies, see PC World Online (www.pcworld.com/aug97/bandwidth). Contributing Editor Scott Spanbauer is author of* The No B.S. Guide to Windows 95 *(No Starch Press, 1996, 800/420-7240). See page 14 for contact information.* ■

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Six tools that get your Internet message across.

By Daniel B. Levine

ELECTRONIC MAIL—can't live with it, can't live without it. At least that's the way I sometimes feel, and I don't think I'm alone.

Internet e-mail is an indispensable part of the way I do business as an independent consultant and writer. I use it to solicit new work, communicate with clients, and manage projects of all sorts, not to mention keep in touch with friends and family.

But the problem is, I get tons of the stuff. Along with vital business correspondence, I get scads of press releases, mailing-list digests, unwanted solicitations for questionable investments, jokes that can't be repeated in good company—they all clog my in-box. ▶

ILLUSTRATIONS: JIM LUDTKE

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NETSCAPE MESSENGER Multiple, nestable folders and searching options let you find old messages when you need them.	folders and searching	JUNO, MICROSOFT OUTLOOK EXPRESS, AND EUDORA PRO Juno can't search, and its folders can't be nested. Outlook Express and Eudora Pro folders are fine, but searching is clumsy.
PEGASUS MAIL You get all the basic filtering tools, plus unique, powerful extras like mailing list management.	filters	JUNO AND E-MAIL CONNECTION Juno doesn't have any e-mail filters at all, and E-Mail Connection's are anemic in options and only partly automated.
NETSCAPE MESSENGER AND MICROSOFT OUTLOOK EXPRESS Both use HTML for Web-page richness; Outlook Express assumes by default that your recipients can view it.	formatting	JUNO You get plain text only; Juno doesn't provide support for file attachments, either.
PEGASUS MAIL Neat touches include phone-message notes and a mail notification icon for your Windows desktop.	extra goodies	JUNO Has few trimmings to speak of, unless you count the advertisements that appear over your in-box.
MICROSOFT OUTLOOK EXPRESS, PEGASUS, AND JUNO They're free, and Juno even includes free service. But for real features, opt for one of the other two.	price	EUDORA PRO At $59 for e-mail only, it's the most expensive package here. At least its technical support policies are relatively generous.

If you face the same dilemma, a good e-mail package can help separate the electronic wheat from the chaff, as well as make your outgoing messages easier to compose, better looking, and safer from prying eyes. This review covers six prominent Internet e-mail packages, ranging in price from free to $59: ConnectSoft's E-Mail Connection 3.1a, David Harris's Pegasus Mail 2.53, Juno Online Services' Juno 1.23, Microsoft's Outlook Express 4.0, Netscape's Messenger 4.0, and Qualcomm's Eudora Pro 3.0. (Note: International Data Group, the parent company of *PC World*, owns a minority interest in Netscape Communications.) All of them work with Windows 3.1 as well as 95 and NT, except for Outlook Express, which is a 95/NT-only product. Microsoft plans to release a Windows 3.1 edition of the package, but hasn't announced when it will be available.

With the exception of Juno, a proprietary service intended for e-mail beginners, the packages here all work with the SMTP and POP3 protocols, which means that you can use them with any Internet service provider. If your company's internal e-mail system uses an SMTP/POP3-compatible mail server, such as Qualcomm's Eudora WorldMail Server, you can also use one of these packages to communicate with your coworkers across the local area network. Right now, SMTP/POP3 servers are less common within corporate environments than proprietary systems that require specific client software, but the differences are starting to blur. Internet packages are adding new features with appeal for corporate users, and proprietary packages such as Lotus's cc:Mail are beginning to support Internet standards.

Better Browser E-Mail

SURPRISINGLY, the two packages that stood above the crowd were Messenger 4.0, which is in Netscape's Communicator suite, and Outlook Express, included in Microsoft's Internet Explorer 4.0. At press time, neither browser suite was shipping in final form, but free downloadable prerelease versions of both were available. Communicator should be formally shipping by the time you read this, but Internet Explorer 4.0 may not be complete until later this summer. For details, see our previews "Netscape: The Great Communicator?" (May) and "Internet Explorer 4.0: The Empire Strikes Back" (June).

These two mail clients mark a big change from Netscape's and Microsoft's earlier ones. Netscape Mail and Internet Mail provided the basic features, but serious users tended to replace them with more powerful stand-alone packages.

With Messenger and Outlook Express, you're less likely to need to upgrade to a better e-mail client, even if you're a demanding user. These two products have caught up with stand-alone clients

in most respects and passed many of them in others, including support for the newest e-mail protocols: IMAP4, the Internet Mail Application Protocol, version 4; and LDAP, the Lightweight Directory Application Protocol. (See "New Standards to Watch For.") They've got the most straightforward user interfaces (except for Juno), each with a look and feel that's consistent with the rest of the applications in its suite.

The other programs here all have their strong points: Pegasus Mail and Eudora Pro have the best tools for automating e-mail handling; E-Mail Connection supports an amazing array of services, including America Online and CompuServe; and Juno, although very limited in features, is as hassle-free as e-mail gets. Can't decide among them? Every package here except E-Mail Connection is either free or available in a downloadable trial version, so you can try several on for size.

Features That Matter

HERE'S A QUICK guide to the most important features to consider as you compare e-mail packages.

Searching and folders. Unless you get only a trickle of incoming e-mail, you'll want the ability to sort messages into a variety of custom folders and retrieve old messages based on the sender, subject, or other criteria. Nearly all the packages here let you create your own nested folders and do fairly sophisticated searches, although Eudora Pro and Outlook Express return search results one message at a time, so you may have to wade through voluminous folders of old mail, instead.

Filters. Also known as rules or agents, filters can do much of the grunt work of dealing with a high volume of mail. A filter is an automated process you create to handle e-mail (incoming messages, generally speaking) based on predefined criteria; once you set up the filter, it usually operates with no intervention on your part. For example, a filter can watch for messages from your boss, then sort them into a high-priority folder, or deep-six any message that contains the phrase "Make money fast!" When you go on vacation, you can have a filter forward your e-mail messages to a coworker. Or you might create a filter to send out corporate information in response to any incoming message with the word "info" in the subject line.

Of the products here, only Juno doesn't have filters. The power of the other clients' filters varies quite a bit: Pegasus Mail and Eudora Pro boast the most versatile filters, and E-Mail Connection's and Messenger's are the most basic—they can file and delete messages but can't forward or reply to them. To create filters in any of the packages, you use dialog boxes filled with options. This is a simple form of programming that takes time to learn.

File attachments. Sending attachments over the Internet has often been a source of grief, with files arriving garbled or not at all. In many cases, however, it's not the client software that's at fault—intermediary gateways in the Internet pipeline have done the mangling. As the bugs get worked out along the way, the situation is improving. In the meantime, most packages here support several common standards for sending attachments across the Internet, such as Uuencoding and MIME, and make it reasonably easy to save incoming files to your hard disk or launch them within the appropri- ▶

recommendations

IF YOU'VE MOVED to one of the new Web browser suites, you already have one of the best Internet e-mail packages. Though we can't name either as a Best Buy until we've seen final versions, we're impressed by Outlook Express and Messenger, the e-mail modules in the prerelease versions of Microsoft's Internet Explorer 4.0 and Netscape's Communicator, respectively. Both are easy to use, handle newsgroups, and support the newest features and technologies. One difference is price: Communicator costs $59; Internet Explorer is free. Another is platform support: Communicator runs on Windows 3.1 as well as Win 95/NT, while IE 4.0 is Win 95/NT only for the time being.

FEATURES COMPARISON

		FEATURES						SUPPORT		
E-MAIL PACKAGE	Street price	HTML formatting	IMAP4/ LDAP	Public key encryption	Searching/ folders	Apply filters to incoming mail/ outgoing mail	Read newsgroups	Free support (days)/toll-free call	Weekday (hours)/ weekend	Fax/online support
E-Mail Connection 3.1a	$50	○	○/○	●	●/●	●/○	○	none/○	6/○	○/●
Eudora Pro 3.0	$59	○	○/○	○	●/●	●/●	○	90/●	8/○	○/●
Juno 1.23	free	○	○/○	○	○/●	○/○	○	none/○	15/●	○/●
Microsoft Outlook Express 4.0	free	●	●/●	●	●/●	●/○	●	none/●	24/●	●/●
Netscape Messenger 4.0	$59 [1]	●	●/●	●	●/●	●/●	●	90/●	14/●	○/●
Pegasus Mail 2.53	free	○	○/○	○ [2]	●/●	●/●	○	none/○ [3]	○/○	○/●

● Yes ○ No [1] Part of $59 Communicator suite. [2] Includes proprietary encryption. [3] Toll call to New Zealand.

1. Other end of connection must also be camera-equipped to see called party. Compatible with any standard H.324, or VDOPhone Internet video software.
2. All x2 products are capable of 56 Kbps downloads; however, due to FCC rules which restrict power output, current download speeds are limited to 53 Kbps. Actual speeds may vary. See **www.usr.com/x2** for details.
3. Actual performance subject to line conditions and Internet traffic.

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ate program. (See "Browser Secrets" in this issue for tips on avoiding file-attachment woes.)

Formatting. Traditionally, most e-mail has been plain text that looks rather gray compared to the graphical realm of the Web. That's changing: Messenger and Outlook Express both let you use the Web's HTML standard to format messages, so you can choose fonts and colors, add graphics, and embed hyperlinks with word processor–like tools. Once most mail packages can handle HTML, this will be a great feature—but few can do so yet. An HTML message received by a non-HTML mail package will contain the text, but it may also be festooned with raw formatting codes.

Security. With horror stories about Internet security breaches making headlines, encrypted mail (sometimes called S-MIME, for "secure multi-part Internet mail extension") is becoming more popular. Unfortunately, the process for using it is still a bit complex. First you must request a "public-key certificate" from a certificate authority such as VeriSign (www.verisign.com). For individuals, the price for this service ranges from nothing to about $20 a year, depending on the provider and the level of security desired. This electronic certificate allows you to digitally "sign" messages, so the recipient knows they really came from you. It also lets you exchange encrypted messages with other users who also own certificates. E-Mail Connection, Messenger, and Outlook Express have built-in public key encryption features; with other packages, you can always use an external encryption utility such as Pretty Good Privacy.

Newsgroups. If you're an avid reader of any of the Internet's thousands of special-interest bulletin boards, or *newsgroups*, it's a great convenience to be able to peruse them using the tools you use for personal e-mail. Messenger and Outlook Express let you do this. With the other e-mail packages, you'll need to get a separate newsgroup reader, such as Free Agent, and learn a new user interface.

New Standards to Watch For

UNTIL RECENTLY, almost all Internet e-mail clients used the POP3 protocol to connect to mail servers and retrieve messages. However, POP3 is an *offline* protocol, which means that a client using it usually downloads messages from the server (either at an ISP or on a company's LAN) to the local hard disk, deletes them from the server, and then displays them.

Messenger and Outlook Express are the only packages here that support a new protocol called IMAP4, which lets you manage your e-mail offline (like POP3); but it can also operate online, so your folders and messages are stored on the server, not on your hard disk.

That's closer to the way proprietary e-mail systems such as cc:Mail handle things, and it's especially helpful if you use more than one PC—say, a desktop at the office and a notebook when you travel. ▶

better e-mail for america online and compuserve

IF YOU USE America Online or CompuServe, most Internet e-mail packages aren't available to you, because AOL and CompuServe use proprietary e-mail systems rather than the standard Internet protocols. Fortunately, there are powerful shareware e-mail tools designed specifically for use with these online services: OzWin II 2.12.2 for CompuServe, and PowerMail 1.3 for America Online.

OzWin II 2.12.2. A venerable offline reader for CompuServe, OzWin lets you efficiently and economically use mail, forums, and other features without actually being connected to the service. (The program dials in to the service just long enough to shuttle data back and forth.) OzWin has many useful features that are missing in CompuServe's own software: It can spell-check your mail, for instance, and it can squelch annoying mail by ignoring certain CompuServe addresses. You can quickly insert boilerplate text into a message, an especially handy feature for business mail such as price quotes. OzWin also includes many tools for ferreting items from CompuServe's forums—you can track a single thread of conversation while ignoring everything else, for example.

As its documentation states forthrightly, OzWin will appeal mostly to power users. It lacks the slick, Web-like look of CompuServe's own software, and the sheer number of options can be daunting. It's also not a total substitute for CompuServe's software, since it lacks some features such as online chats.

PowerMail 1.3. This utility gives America Online's own software an extra menu and a customizable toolbar devoted to e-mail features that are much more powerful than AOL's standard fare. Like OzWin, PowerMail provides a spelling checker and the ability to store text blocks that you can retrieve and alter as necessary for a particular message. It can encrypt messages so no one can read them without entering a password. You can also set up keyboard macros to automate tasks such as forwarding messages.

The one big annoyance with using PowerMail: it appears *in addition to* AOL's existing e-mail tools, not in place of them. To make use of its extra features, you've got to remember to use the PowerMail menu rather than the standard Mail menu.

—Harry McCracken

• OzWin II 2.12.2 $69 registration fee, Ozarks West Software, GO OZWIN on CompuServe for more information.

READER SERVICE NO. 632

• PowerMail 1.3 $35 registration fee, BPS Software, 703/716-9137 or keyword BPS on America Online for more information.

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Because mail is stored on the server, you have access to your messages from whatever PC you use. IMAP4 can also make using e-mail via modem faster—if you get a message with a huge attachment that you don't need just then, you can postpone downloading it until later.

Right now, there's a big gotcha with IMAP4: It works only if both your mail client and the server you're connecting to support it, and plenty of products still don't. Look for IMAP4 to become more common as interest in it grows.

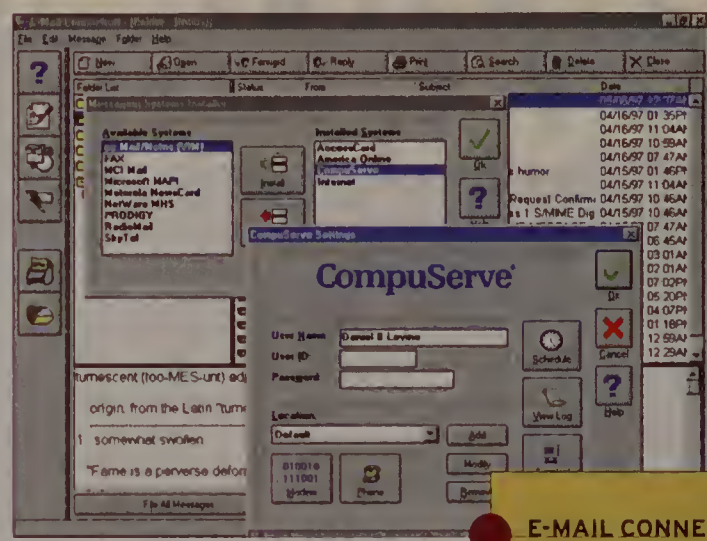
Another recent development is the use of LDAP, a protocol that stores directories of e-mail addresses in a standard format rather than in the proprietary ones that mail programs have usually employed. An LDAP directory on your company's server can contain the e-mail addresses of all employees; public LDAP directories are also available over the Internet (see "White Pages for the Internet").

Like IMAP4, LDAP is far from universal: The only products here that support it are Messenger and Outlook Express. Do you need it? Yes, if you plan to use a LAN-based Internet mail server within your organization. Sharing a single corporate address book is much simpler than making each user maintain a separate one. But if you're just using a personal ISP account, you can always search a public directory in your Web browser, then paste the address into your e-mail package.

With IMAP4 and LDAP, an internal e-mail system built around an Internet mail server and clients is much better equipped to compete with proprietary e-mail systems. Ironically, most of the old-line systems are now moving toward Internet protocols. The bottom line: While your company may currently use a system that locks you into using a specific mail client, it's likely you'll eventually be able to choose the e-mail client that best fits your work habits.

The Configuration Tango

SETTING UP AN Internet e-mail package can be painful, mainly because you need to configure your software with some information specific to the mail server you're connecting to. Most products here have wizard-style setup features that help, but you may still need advice from your ISP to get them working properly.



E-MAIL CONNECTION'S single in-box can handle Internet mail, America Online and CompuServe mail, and much more.

If you do have trouble, you might have to pay to talk to a real live tech support person. None of the three free packages comes with free phone support, nor does E-Mail Connection. Only Eudora Pro and Messenger provide no-cost toll-free phone help, for the first 90 days.

E-Mail Connection 3.1a

PRO: Works with lots of e-mail services; sends and receives faxes; imports address books.

CON: Limited features in some areas, skimpy technical support.

ONCE UPON A TIME, Microsoft envisioned that the Inbox icon on every Win 95 desktop would provide one-stop shopping for e-mail, faxes, and every service under the sun. Microsoft never made it happen, but ConnectSoft did. Its $50 E-Mail Connection runs under Windows 3.1 and Win 95 and jams support for a raft of services into one box—including Internet mail, America Online, CompuServe, Prodigy, Lotus Notes, and others. It even handles faxes and pager services.

Putting messages from such disparate services into a single in-box is enormously convenient if you need to monitor multiple e-mail accounts, but E-Mail Connection does not have the same range of features for each service as would a dedicated client. Unlike America Online's and CompuServe's software, for example, E-Mail Connection doesn't allow you to choose whether or not to download a particular message—a big omission, because AOL and CompuServe accounts often accumulate vast quantities of junk e-mail.

It's easy enough to sort messages into custom folders and do simple searches, but E-Mail Connection's filters are weak: They can only sort mail into folders, not autoforward or autorespond, and they take effect only when you click a button. There's no support for MAPI 2.0, which means you can't send messages from within mail-enabled applications.

On the plus side, E-Mail Connection has a very good Security Wizard that walks you through requesting a VeriSign certificate for encrypted mail. The program can also can import address books from Eudora, CompuServe, and Netscape Mail, helping smooth the transition if you're moving from one of those packages. Too bad ConnectSoft's support policies are parsimonious. If you want to talk to a real person, you have to pay $1 per minute from day one, and the toll line is available only 6 hours a day. *ConnectSoft, 800/889-3499, www.connectsoft.com.*

READER SERVICE NO. 626

Eudora Pro's user interface remains better suited to e-mail pros than beginners and casual users.

Eudora Pro 3.0

PRO: Excellent filters provide advanced automation; modest hardware requirements.

CON: Poor searching tools; user interface is sometimes confusing.

IN INTERNET TIME, Qualcomm's Eudora has been around forever. And once you've tallied up all the versions available for multiple platforms, it's the most ▶

*Based on May '97 industry average of 13 major ISP's and online service providers tested. **Telephone access and other charges and taxes may apply. Other terms and conditions apply.

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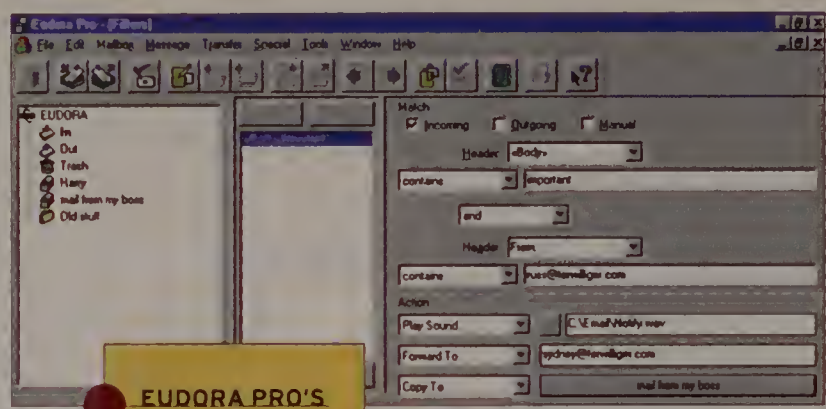
widely used Internet e-mail software there is. But now the full version of Eudora Pro costs $59, and there's no lack of e-mail programs to choose from. How is this pioneering package holding up?



EUDORA PRO'S interface is arcane at times, but its filters provide powerful automation.

Eudora Pro retains some strengths, not the least of which is that it works nicely on any machine that can run Windows 3.1, a feature that the resource-hungry Microsoft and Netscape products can't claim. (Both Windows 3.1 and Win 95 versions are included in the box.) Its powerful filtering, second only to Pegasus Mail's, makes it a good choice if you want to automate managing a heavy e-mail load. As messages arrive that match your predefined criteria, e-mail filters can activate a wide range of actions, including sending out a canned response or running another application.

The package doesn't allow you to use HTML for fancy formatting, but you do get a little control over font size and color using the MIME text/enriched standard. This standard isn't widely used, but other Eudora users can receive messages that were formatted with it.

Eudora's interface remains better for e-mail pros than for beginners or casual users; it's the least helpful package here in steering you through the often tricky job of configuring the software to work with your server. But the program's weakest spot is its slow, crude search engine. You can search for only a single keyword, and the program displays just one retrieved message at a time—infuriatingly time-consuming if you've got a large archive of old mail.

Casual users should check out Eudora Light, a freeware version (available from Qualcomm's Web site) that lacks many of the Pro edition's features, such as enhanced filtering and support for multiple ISP accounts. *Qualcomm, 800/238-3672, www.eudora.com.*

READER SERVICE NO. 627

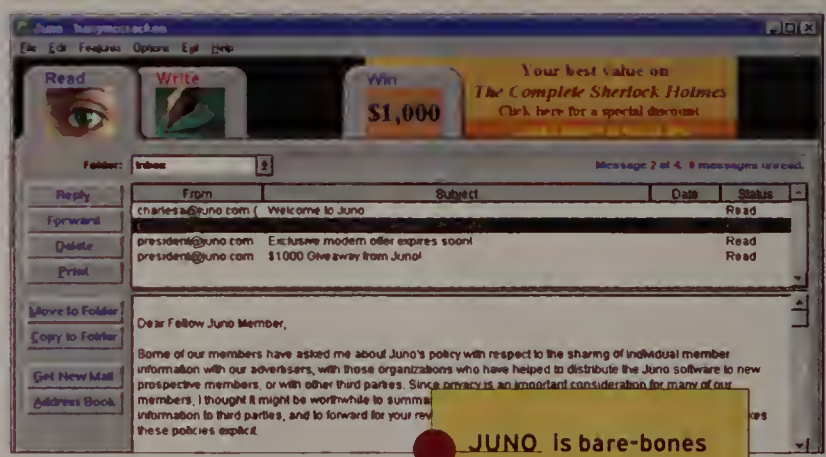
Juno 1.23

PRO: Free software and service; very easy to install and use; can import address books from other services.

CON: Plain-vanilla mail with ads; can't handle attachments; no free phone support.

SOME OTHER PACKAGES here are free, but only Juno includes free e-mail service as well as software, for true no-cost e-mail—no ISP required. Though it offers only the most basic of features—it can't even handle file attachments—it's by far the simplest product to set up and learn. That makes it a contender if you're new to e-mail, or don't care to spend $20 a month for an ISP account. Phone support is the one thing you'll have to pay for, at $1.95 a minute via a 900-number line.

Unlike other mail clients, Juno requires no Internet savvy to set up; the most time-consuming step is filling out a questionnaire on the intimate details of your consumer habits, hobbies, household income, and the like. From then on, Juno targets you with ads that appear above your in-box—you can either ignore them or let them whip you into a froth of consumerism. Juno provides local dial-in numbers across the country, but it's an e-mail service only—you'll need an ISP account to access the Web or use other Internet features.



JUNO is bare-bones e-mail with ads, but it's free and good-looking, and it won't intimidate beginners.

Once you're up and running, Juno assumes nothing about your level of technical expertise. It provides spell-checking for outgoing messages and folders for sorting incoming ones, but that's about all you get: There are no filters, search tools, or other features that are essential for managing a steady stream of e-mail. If you have very basic needs, though, Juno's a nice package. *Juno Online Services, 800/654-5866, www.juno.com.*

READER SERVICE NO. 628

Microsoft Outlook Express

PRO: Easy to use; HTML formatting; newsgroup reader; built-in directory searching.

CON: Doesn't run under Windows 3.1; clumsy search feature; no free phone support.

INTERNET EXPLORER 4.0's most innovative feature is undoubtedly the way it meshes its Web browser with the Windows desktop. But the hullabaloo over this integration should not overshadow IE 4.0's excellent e-mail client, Outlook Express, a much-improved version of IE 3.0's e-mail package. And Internet Explorer is free except for phone tech support, which costs $35 per incident. (If you get the package with a new PC or an Internet account, you may be able to get no-cost help from the manufacturer or ISP.)

Despite its name, Outlook Express bears slight resemblance to Outlook, the personal information manager that ships with Microsoft Office 97. But confusing name aside, Outlook Express gives you almost everything you might want in an Internet e-mail client, with a very straightforward user interface. You get support for multiple accounts, easy encryption, filters, and the ability to handle Internet newsgroup messages in addition to your personal e-mail. Using LDAP, the program also lets you quickly search Internet directory services right from within its address book. ▶

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- 16MB RAM (72MB Max.)
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Like Netscape Messenger, Outlook Express can use HTML for text formatting, letting you insert the same colors and fonts used by Web pages—even tables, graphics, and links. But though most other e-mail clients don't support HTML yet, it sends off HTML mail by default, assuming in that cute Microsoft way that everyone in the world uses Microsoft products and has upgraded to the latest version. Recipients who haven't done so may see unsightly raw HTML code in the messages they receive from you. (At press time, Microsoft said that the final version of the package will have features for tracking which recipients can and can't receive HTML mail, similar to those in Netscape Messenger.) The package's search tool could also stand improvement: Rather than returning results in a new window for easy browsing, it makes you tediously step through each message one by one.

One last point—Outlook Express is the only package here that won't work under Windows 3.1, and even a minimal installation of the Internet Explorer suite will consume an imposing 43MB of disk space. *Microsoft, 800/426-9400, www.microsoft.com.*

READER SERVICE NO. 629

Netscape Messenger 4.0

PRO: Easy to use; HTML formatting; built-in newsgroup reader and LDAP directory searching.

CON: Lacks some e-mail filtering options; tricky to configure multiple e-mail accounts.

FEATURE FOR FEATURE, Netscape's Messenger 4.0 is remarkably similar to Microsoft's Outlook Express: Both have slick interfaces that are easy to master, both have lots of features, and both let you read Internet newsgroups with the same tools you use for your personal e-mail. Like Outlook Express, Messenger is part of a Web megasuite, in this case Netscape Communicator, a mammoth download (available in Windows 3.1 and Win 95 versions) that needs between 8MB and 15MB of disk space and includes a browser, collaborative tools, conferencing, and more. Though not free, this $59 suite is a great deal.

Messenger's interface is a big improvement over that of its dowdy predecessor, Netscape Mail. Like the Navigator 4.0 Web browser and Communicator's other apps, Messenger sports large, clear toolbars that you can drag around or hide as you wish. Thanks to its LDAP support, it's easy to search online e-mail directories from within the address book, a feature that only Outlook Express matches.

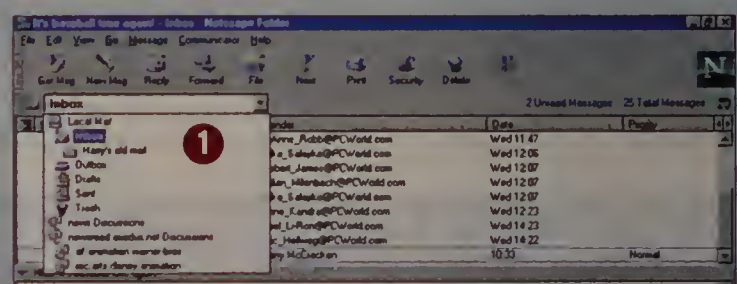
Messenger and Outlook Express are also the only packages here that let you send HTML-formatted e-mail with fancy fonts and hyperlinks. Thankfully, Messenger keeps track of which recipients can receive such mail, alerting you to potential problems and converting to plain text when necessary. It does this by remembering whether people have sent you HTML messages before, and by letting you manually select the preferred format for each addressee.

Messenger 4.0's weaknesses include filters that suffer a bit in comparison to those in Eudora Pro, Outlook Express, and Pegasus Mail. You can create filters that delete or file messages automatically based on keywords or other criteria, but there's no way to have Messenger automatically respond to messages or forward them to another account.

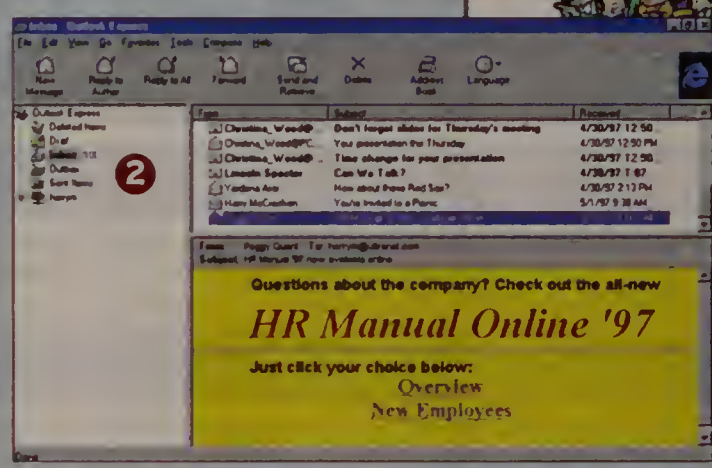
Also, there's no way to quickly check e-mail from more than one account—say, your work account and one at a personal service provider—although a separate utility lets you set up multiple profiles for different users. *Netscape Communications, 415/937-3777, www.netscape.com.*

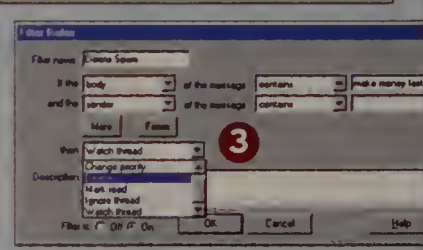
READER SERVICE NO. 630 ▶

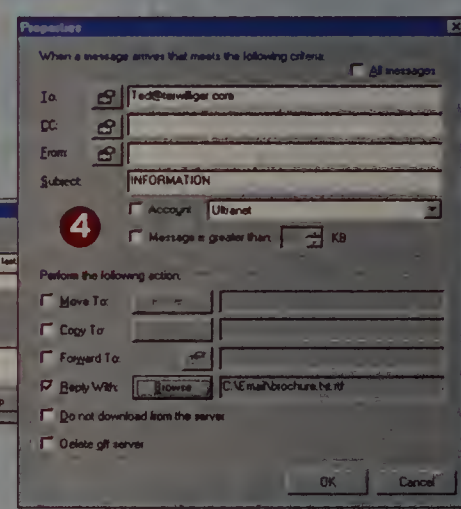
NETSCAPE MESSENGER VS. MICROSOFT OUTLOOK EXPRESS



MESSENGER AND OUTLOOK EXPRESS both sport large, well-marked toolbars; both handle newsgroups as well as personal mail. The biggest difference in their interfaces: Messenger uses a drop-down folder list (1), while Outlook Express puts folders into a pane on the left-hand side of the screen (2). Both let you create HTML-formatted messages with rich formatting, color, graphics, and links.







Both packages offer e-mail filters. Messenger's (3) can automatically delete and file messages, but Outlook Express's filters can also autoforward and autoreply—this one (4) responds to e-mailed requests for information with a text file.

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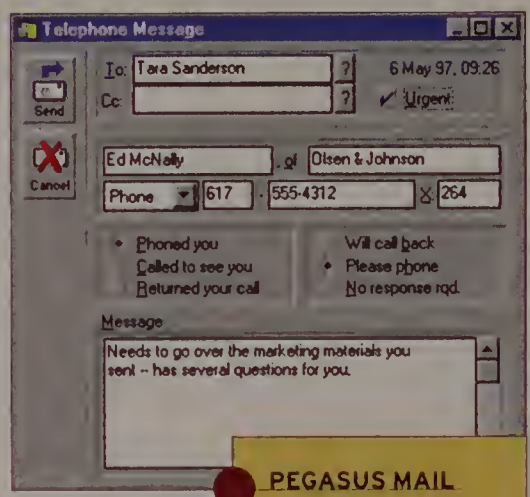
Pegasus Mail 2.53

PRO: Free; powerful; many inventive features.

CON: Interface may be complex for beginners; no U.S. number for phone support.

IF YOU'RE AN experienced user, don't spend money on another e-mail package without first downloading Pegasus Mail, available in Win 3.1 and Win 95 versions. Produced by David Harris, a generous New Zealander, this popular, powerful package won't cost you a thing unless you need a printed manual, which costs $35.

This home-grown package boasts some features that the packages from corporate behemoths Microsoft and Netscape can't equal. Its filters are hands-down the most powerful here: They can automatically launch other applications, file incoming or outgoing messages in a variety of ways, and even manage Internet mailing lists. Other clever touches include the ability to annotate mail you've received (useful for jotting notes to yourself) and to send "While you were out" alerts, handy if you are using the package for e-mail within your company. You may need the on-screen help to figure out some features, though, such as the way you sort mail into both "trays" and "folders."



PEGASUS MAIL offers creative tools such as a while-you-were-out form.

Pegasus Mail doesn't offer HTML for rich formatting, and the version I tested didn't support the IMAP4 and LDAP protocols. IMAP4 is planned for an upgrade due this summer, and the program already matches one of its features by letting you download mail selectively. For example, you can avoid transferring large attachments over a slow modem line.

Phone support for Pegasus is only available through a yearly contract, and it's a toll call to New Zealand, which is 17 hours ahead of the United States. Alternatively, you can get free support via an automated e-mail service. Of course, if you can't get the program to work at all, it may be hard to send an e-mail message asking for help. *David Harris, www.pegasus.usa.com.*

READER SERVICE NO. 631

online *Visit www.pcworld.com/aug97/e-mail for a look at the best e-mail package add-ons. Daniel B. Levine is a consultant and writer in New Jersey. Harry McCracken is a senior associate editor for* PC World. *Bob Stepno is a writer in North Carolina.*

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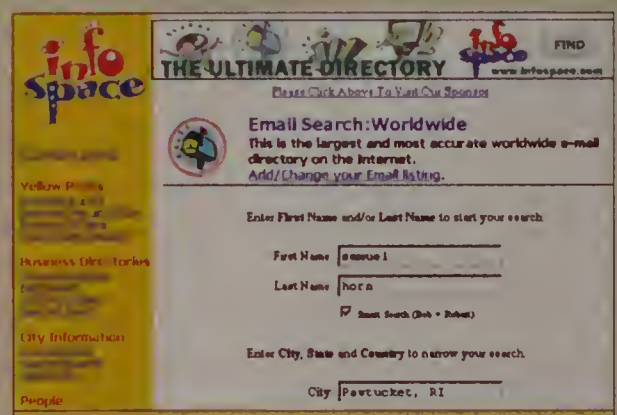
white pages for the internet

HAVING TROUBLE tracking down the right e-mail address for a prospective business partner or an old friend? For help, you can turn to one or more of the many e-mail "white pages" search services on the Web. I used six such services—Bigfoot, Emailbook, Four11, Internet Address Finder, InfoSpace, and MIT's Usenet-Addresses Service—to search for four far-flung old friends: Julie, Janet, Howard, and Bob. I also searched for my own address and that of Harry, my editor at *PC World*. InfoSpace performed best, locating everybody but Howard; only Emailbook failed to come up with any addresses at all.

A basic search in any of the services is simple enough: Type in the person's name, and you get a list of names and e-mail addresses that match. Of course, the results may well include other people who just happen to share the name of the person you're really searching for. InfoSpace was the only directory that made it easy to verify that the Bob I found was the right Bob—besides his e-mail address, it showed his street address and a map that pinpointed his condo.



FIND MISSING PERSONS with InfoSpace's online e-mail address white pages service.

(Whether Bob, or anyone else, really *wants* this information available on the Web for all to see is another question.)

When my exact search failed, some services also looked for names with the first initial I'd specified. With others, I needed to use DOS-style wild cards such as "Rob*." InfoSpace and Four11 were smart enough to translate nicknames into a double search for the likes of "Bob" and "Robert."

Just because a directory provides an e-mail address doesn't mean your search is over. For example, some had outdated ones for Harry and Janet; when I sent them mail, I got an error message.

In some cases, you may need to do additional legwork. For instance, none of the directories located Howard, but I did find someone in his home state that had the same last name. Could this be his sister who went to medical school? It was, as I confirmed when I searched for her name using the AltaVista search engine, and got a report of her delivering a patient's sextuplets! The lesson here: If you can't locate someone, you may be able to find a relative who can serve as an intermediary. **—Bob Stepno**

E-mail Address Directories

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- www.iaf.net
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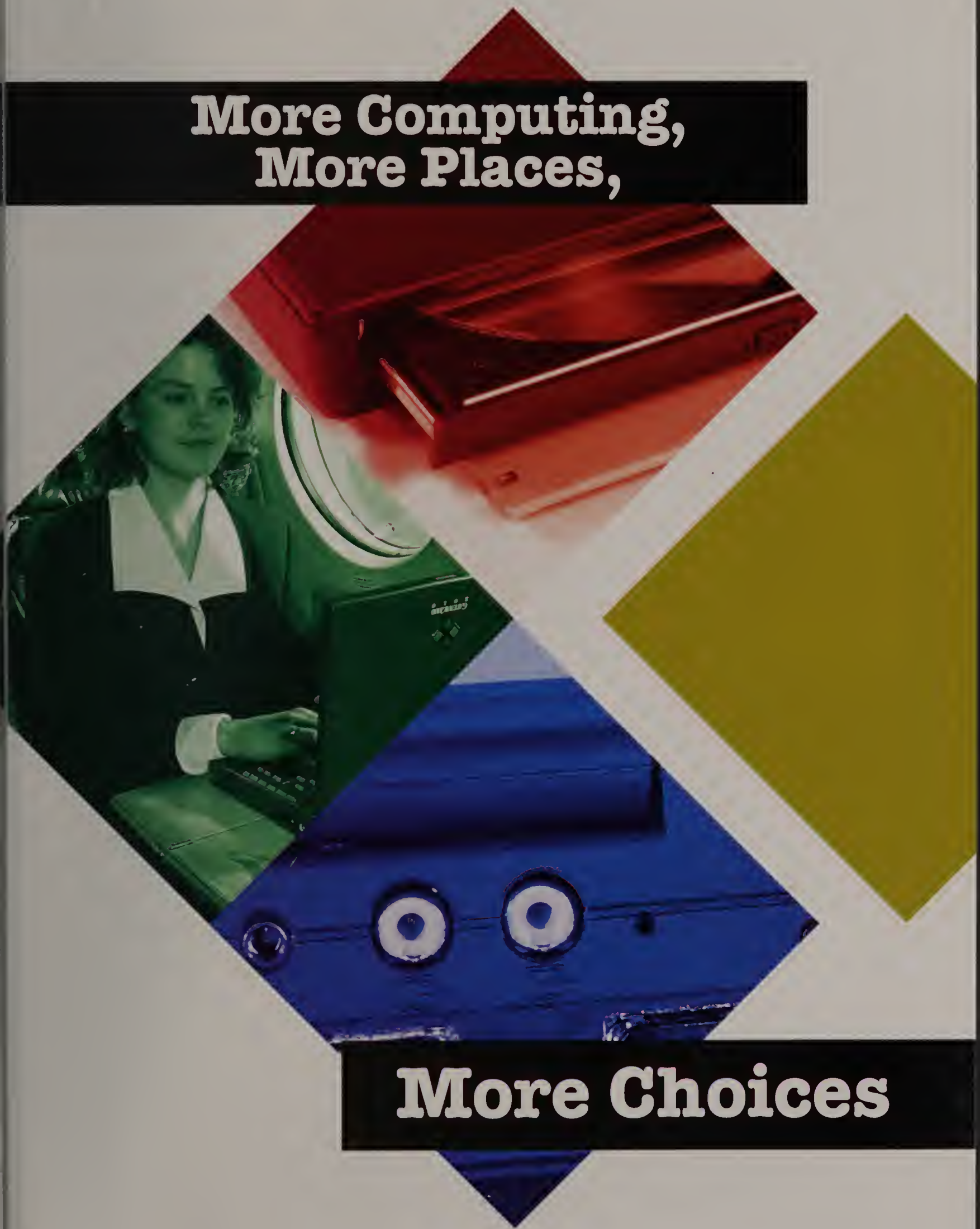

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- MS® Works 95
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$1899 *Business Lease* $70/mo.*

2200SE

- 12.1" SVGA TFT Color Display
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- 16-Bit Wavetable Sound with Stereo Speakers
- NiMH Battery & AC Pack
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- EZ Pad Pointing Device
- Casual Carrying Case
- MS Windows 95
- MS Works 95
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- Casual Carrying Case
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- MS Office 97, Small Business Edition plus Encarta® 97
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2300LS

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- Intel 150MHz Pentium Processor with MMX Technology
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- 256K Pipelined Burst Cache
- 1MB EDO Video RAM
- USB & Zoomed Video Ports
- NTSC/PAL Video Output
- 2GB Hard Drive
- Modular 6X min/11X max CD-ROM Drive
- Modular 3.5" Diskette Drive
- 16-Bit Wavetable Sound with Stereo Speakers
- 33.6 PCMCIA Data**/14.4 Fax Modem
- 12-Cell Lithium Ion Battery & AC Pack
- 85-Key MS Windows 95 Keyboard
- EZ Pad Pointing Device
- Casual Carrying Case
- MS Windows 95
- MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service and Support for Portable PCs

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9100XL

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- 256K Pipelined Burst Cache
- 4MB Video RAM
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- 16-Bit Wavetable Sound with Stereo Speakers
- 33.6 PCMCIA Modem with x2™ Technology**
- Two 12-Cell Lithium Ion Batteries & AC Pack
- 88-Key MS Windows 95 Keyboard
- EZ Pad Pointing Device
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- MS Windows 95
- MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service and Support for Portable PCs

$5999 *Business Lease* $215/mo.*

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- Upgrade From Casual Carrying Case To Deluxe Carrying Case **$25**
- Gateway Solo Mini Docking Station **$199**
- Gateway Solo Docking Station **$599**
- 33.6 PCMCIA Data**/14.4 Fax Modem **$20**
- 33.6 PCMCIA Fax Modem with x2 Technology** **$200**
- 2100/2200 NiMH Battery **$95**
- 2100/2200 Lithium Ion Battery **$190**
- 2300/9100 Lithium Ion Battery **$250**
- 2300 NiMH Battery Option **$125**
- PCMCIA 3Com® Ethernet Twisted Pair Adapter **$129**
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NOW PLAYING

best of the net

The 101 best Web sites, chat rooms, and newsgroups on the Internet.

TRYING TO FIND USEFUL INFORMATION on the Internet is like rummaging through a teenager's bedroom. The encyclopedia is mixed in with the comic books. A PC manual is buried under some soiled socks. And don't even think about looking under the bed. You don't want to know.

What you want is information you can use—right now. That's why we assembled this guide to the best of the Internet.

Here you'll find the top sites for computing and commerce, business and home, work and play. We tell you how to get technical support at 2 a.m. and where to find funding for your start-up. We also locate the best sites for helping you stay competitive, change jobs, make plane reservations, finance a new home, even find true love. Don't worry, we haven't forgotten the Web's strange and unusual sites (check out the Twinkies site or the Bureau of Missing Socks).

But the Net is more than just the Web. We've listed the best Usenet newsgroups for particular topics (see "Usenet or Lose It: Best Newsgroups"), and the best places to engage fellow Netizens in real-time chat (see "Talk is Cheap: Best Chat Areas"). Because life is too short to be lost on the Net. ▶

By Michael Cahlin, Matt Lake, and Dylan Tweney

Computers

THE BEST PLACES TO...

Get Tech Support at 2 a.m.

www.supporthelp.com

Printer blue? Software flu? If your vendor is unreachable, try SupportHelp.Com. This terrific *free* service warehouses tech support sites, e-mail, bulletin boards, and phone numbers for more than 3000 companies. It even checks to see if a Usenet newsgroup is available to help.

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Smart, very smart. We're talking about the staff at TuneUp.Com. For a measly 4 bucks a month, they'll answer computer questions by e-mail within 2 hours during business hours. Or within 2 hours of opening the next day if your question arrives at night. Members can also download the latest drivers and get helpful tips.

Find Cool Net Tools

www.cooltool.com

Dripping with Gen-X Nettitude, Cool Tool of the Day reviews Internet utilities and plugs-ins almost daily. You can join the Cool Tool mailing list or search the site by keyword, platform, or helpful categories. At BrowserWatch (www.browserwatch.com) you'll find up-to-the-nanosecond links to all plug-ins available on the Net.

THE BEST PLACES TO START

LOOKING FOR A NEW home page on the range? In the spirit of shameless self-promotion, let us humbly suggest three sites of our own for starting your Web odyssey. A good beginning is right at **PC World Online** (www.pcworld.com). Here you'll find everything that appears in the print version and a lot more, including daily news updates and an interactive Top 20 where you can roll your own Best Buys.

Next, check in at **Tip World** (www.tipworld.com) for byte-size computer tips, tricks, news, and gossip delivered by e-mail to your virtual door. Choices include Windows, Navigator, Games, and more.

Finally, stop by **The Web Magazine** (www.webmagazine.com) for the lowdown on everything from the wired to the weird. Popular culture *is* Web culture—and The Web Magazine reviews it all.

Foil Would-Be Hackers

www.ncsa.com

Don't get hacked, get even. The National Computer Security Association's tips, links, security alerts, libraries, and search engine are the best ways to learn how to keep data secure. From data encryption news to antivirus blues, you'll find it here.

Master Your Domain

rs.internic.net/cgi-bin/whois/

Want to register *yourname*.com? It might already be taken. The InterNIC site's Whois search will find domains by owner and give you contact information in case you want to bid on a domain someone else already owns. (For example, Devil.com is a steal at $6660.)

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www.realaudio.com

Progressive Networks' free RealAudio plug-in brings live news, sports, and music to your PC. The spanking new $29.99 RealPlayer Plus 4.0 lets you scan the virtual airwaves, choose six preset sta-

usenet or lose it best newsgroups

WANT TO ENGAGE in a stimulating discussion about hubcaps? How about dental floss? Skip the Web and go directly to a Usenet newsgroup. Here you can post questions, get answers, and uncover the naked skinny on any topic you imagine—including lots of news about PC products and companies. All you need is an Internet account that offers Usenet access, and a newsreader, like the ones built into the current versions of Netscape Navigator and Microsoft Internet Explorer. Here are 30 good places to start. Good luck!

Strictly PC. If you're good at sorting and sifting, **comp.os.ms-windows.win95.misc** is Windows central, with hundreds of news posts daily. If that's too much, start with **comp.os.ms-windows.win95.setup**. Read any group under **comp.sys.ibm.pc.hardware** for advice (and complaints) about hardware. If you're looking to pick up a cheap PC, read **misc.forsale.computers.pc-specific.systems**. Meanwhile, Microsoft's news server at **msnews.microsoft.com** carries hundreds of product-specific groups.

Dough.Re.Me. Wanna save some money? Log on to **misc.consumers.frugal-living**. You'll find tips on making dental floss last and how to sell your body parts, plus a FAQ on dumpster diving. Not sure about where to stash your cash? **Misc.invest.mutual-funds** will give you a good start, and then you can read **misc.invest.stocks** (and its amazing investment FAQ) when you get serious.

Fast Company. The CEO of business newsgroups is the high-volume, general interest **alt.business**. It's also high in *spam* (unsolicited junk e-mail). **Misc.business.consulting** and **misc.business.marketing.moderated** are low-volume, low-spam groups where you can find business solutions, ask a question, even

tions, and even record your own stuff. Sound quality varies from fuzzy AM to funky CD, depending on your speakers.

Turn Your $2000 PC Into a $1.19 TV Guide

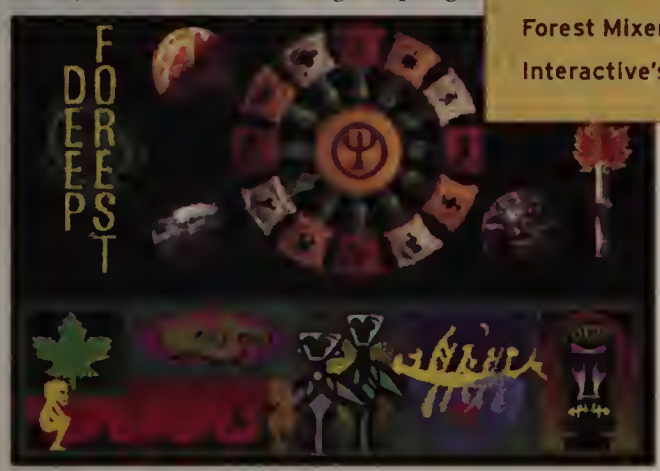
www.tvtonight.com

Surfing the *other* tube? TV Tonight lists every network, cable, and premium cable show available in your zip code. Links include episode descriptions, air dates, and reviews, along with silly rating icons like the Happy Box and Mr. Yeech.

Turn Your $2000 PC Into a $1000 Music Mixer

www.mbinter.com

Download Macromedia's free Shockwave plug-in, and glide on over to M/B Interactive. CD-quality sound, funky animations, and galloping graphics help you mix yourself silly using M/B's stunning audio controls. From junglematic to electrobop, the streaming audio helps you discover the digital DJ within. Chaka-khan!



MIXMASTER: Play the DJ with the Deep Forest Mixer at M/B Interactive's site.

Find Out if You Need a Life

www.starfishsoftware.com

Download a free copy of InternetMeter Inlay 2.0 from Starfish Software's site, and pay close attention to the online activity meter. You might be surprised how much time you *really* spend Web surfing.

Stash Your Data

www.connected.com

We believe that you back up regularly. Of course you do. But if you don't store your backed-up copies *off-site*, they are still vulnerable to theft, fire, and any number of other disasters. With Connected Online Backup, you can use the Web to keep your data safe and sound. Connected's free backup software is easy to set up, and the storage prices are reasonable: $14.95 per month for 50MB of storage, 25 cents per each additional megabyte.

find a mentor. For tips on selling products abroad, consult **alt.business.import-export** or **biz.marketplace.international.discussion**.

Be Fruitful and Multiply. For help planning a pregnancy or surviving your current one, waddle on over to **misc.kids.pregnancy**. **Misc.kids** is an intelligent compendium of child-rearing wisdom. Consult the **misc.education** groups for discussions of public and private schooling. When you can't take it anymore, fly over to **misc.kids.vacation**.

Jock Life. Do the Rockies have a chance this year? The denizens of **alt.sports.baseball.col-rockies** think so, but you'll probably get a less biased opinion in **rec.sport.baseball**. If your news server carries the commercial Clarinet groups, you can follow women's basketball on the read-only **clari.sports.basketball.college.women**; otherwise, check **rec.sport.basketball.women**.

Dirty Words. Everybody does it, but nobody talks about it—except on Usenet. The seminal discussions lie under **alt.sex** (notably, **alt.sex.extraterrestrial**), but most of these groups are littered with ads for cybersex sites. Torn between two lovers? Stop feeling like a fool and read **alt.polyamory**. Addictive types can stick with **alt.recovery.addiction.sexual**; victims of abuse support each other in **alt.sexual.abuse.recovery**.

Sound and Fury. Still pining after Kristin Scott-Thomas? Share your longings in **rec.arts.movies.people** or **alt.fan.actors**. You can catch up on your favorite *The Young and the Restless* characters in **rec.arts.tv.soaps.cbs**. If you're wondering what that old *Valley of the Dolls* soundtrack is worth, ask in **rec.music.marketplace.vinyl**. And when everything falls to pieces, you can take refuge in **alt.music.abba**. —Scott Spanbauer

THE WACKY WIDE WEB

Find Out What's in a Twinkie (www.owlnet.rice.edu/~gouge/twinkies.html) What's more deranged: Eating a Twinkie, or spending days and nights, as these mad scientists did, conducting intensive scientific analysis on them? The T.W.I.N.K.I.E.S. Report—Tests With Inorganic Noxious Kakes In Extreme Situations—includes experiments like rapid oxidation (using a Bic lighter and rubbing alcohol) and radiation (microwave).

Business

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Get the Company Line

www.prnewswire.com
www.businesswire.com

BusinessWire and PR Newswire give away loads of useful material online. Both sites are cleanly designed, providing useful searches, timely information, and company background stories. Though PR Newswire's content is spin-doctored, many companies have empirical data (such as SEC records) attached.

Become the Next Bill Gates

www.sbaonline.sba.gov

One of Uncle Sam's best-kept secrets, the Small Business Administration site is an excellent resource for starting and maintaining a business. Besides helpful software, you'll find online tutorials and information about SBA assistance programs and applications.

Raise a Million Bucks

www.vfinance.com

So, you've got a killer idea for a Java-based mousetrap, and you've got a business plan. All you need is a little cash infusion, right? Stop by the Venture Capital Resource Library for some free tax, legal, ▶

and strategic information. You can download a free business plan template, and even submit your plan via a form if you want the site operators to give you some advice. Just remember us when you strike it rich.

Get the Lowdown on Competitors

www.hoovers.com

Yes, Hoover's saves its detailed profiles of public and private companies for its $10-a-month subscribers. But its free IPO backgrounders, stock tracking, and 10,000 capsule company reviews ain't so shabby either; in addition, there's contact info, sales and employment figures, and Web site links galore.

HOOVER'S can pull up thousands of capsule company reviews.

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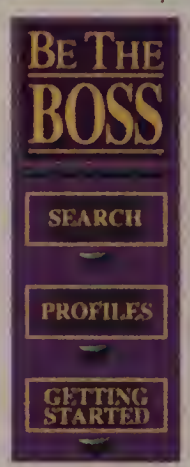
The Web is stuffed with newspapers, RealAudio radio broadcasts, weather reports, stock feeds, and cartoons. How's a busy business person supposed to find the important stuff? Browse Crayon's vast compendium of free online news sources, check off the ones you like, and henceforth, whenever you visit your personal page on the site, scroll down the links on the left to visit your news sources of choice.

Start Your Own McFortune

www.betheboss.com

Whether you're the Roto-Rooter type or an aspiring Jerky Hut owner, if you really want to be your own employer, Be the Boss should be your home page. It provides background on major franchisers, a huge list of companies, and the most comprehensive set of links to entrepreneurial resources we've seen.



Careers

THE BEST PLACES TO...

Find a Dream Job or Employee

www.jobtrak.com/jobguide/

Searching for a job is a job in itself, but so is finding good employees. Jobtrak, Margaret Riley's guide to employment opportunities and resources on the Internet, is an excellent first stop primer for job seeker and employer alike. In tandem, don't miss The Riley Guide's gold mine of links to employment search sites at www.jobtrak.com/jobguide/multiple.html.

Create a Killer Résumé

jobsmart.org/tools/resume/

Before you post that résumé, visit JobSmart. This thoughtful site not only teaches you how to build the best résumé for your intended career, it shows you how to evaluate the online résumé banks and provides links to the top dozen or so where you can post yours.

Hire a Virtual Headhunter

www.espan.com

www.nationjob.com

Don't want your résumé online, for your boss to see? Use a virtual headhunter. NationJob's Personal Job Scout (P.J. Scout to its friends) and E-Span's CareerMail are the ideal agents: On a regular basis, they e-mail for free job listings that match a profile you enter at the sites.

Translate New York Dollars Into Duluth Dollars

www.homefair.com/homefair/cmr/salcalc.html

So you've been offered a job with a 15 percent pay raise in a new state? But how much will that enticing salary *really* buy in another town? Come to The Homebuyer's Fair, and enter the names of your current and future home towns and your salary. Homebuyer's Fair spits back what your paycheck's worth in the new burg.

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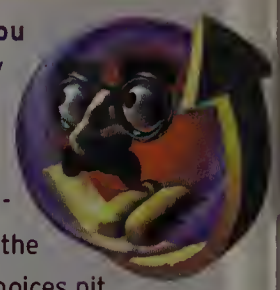

Find Out How Looney You Are (www.geocities.com/TelevisionCity/1568/) Sufferin' succotash! Who is the best Looney Tunes character—the wascawy wabbit or the dishpicable duck? Other choices pit Tweety Bird against the Tazmanian Devil, plus you can take a twicky twivia test.

Motivate a Pessimist (www.speedoflight.com/techs/ray/death/) We all need a kick in the pants. At The Death Clock, you get yours by calculating when you'll kick the bucket. Enter your birth date and gender, and select *DeathClock, Pessimistic,* and *Sadist.* Then be prepared to see how many seconds you have left ticking away until that inevitable day.

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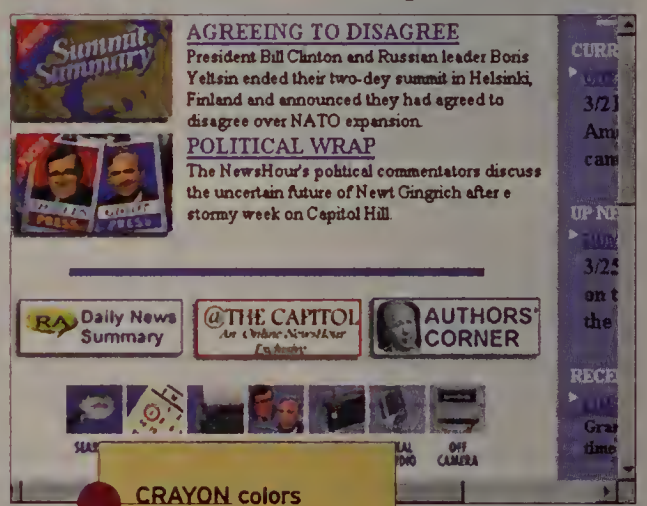

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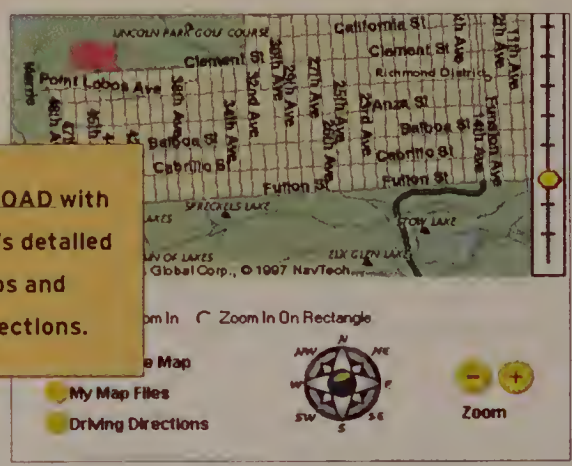

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Get Your Kicks on Route 66

www.delorme.com/cybermaps/cyberrouter.htm

Planning a quick business trip across state lines? Before you hit the highway, stop by Delorme's CyberRouter (an online version of the company's Map'n'Go software). The site helps you pick the shortest or quickest route between two cities and provides an itinerary that's as concise or as detailed as you need.

Get Hard Copy in a Strange Town

www.kinkos.com/info/

www.sirspeedy.com/SirSpeedy/Where/

Why carry paper in your carry-on? These two sites help you find all the Kinkos or Sir Speedy print shops in virtually any town. Better yet, you can send your print job ahead electronically and have it waiting at your destination.

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Like many Web sites, Inside Flyer will book your flight via the Internet Travel Network site (www.itn.com), but that's only the beginning. Check here for links to the best deals in flyer and hotel programs, frequent flyer links, and hefty doses of humor and consumer advocacy.

Land a Free Trip to Paris

www.tscentral.com

www.techweb.com/calendar/

Want to visit Paris in the spring but can't afford the fare? No problem—just find a conference you can attend and let your boss foot the bill. (Hmmm, next February's BioExpo looks *très interessante*...) Trade Show Central and TechWeb let you look up domestic and international trade shows by location, date, or category and get conference schedules; you can even register without having to stand in line.

Find Things to Do in Toledo (or Anywhere Else)

city.net

City.net's highly usable guide to the cities of the world has clickable image maps that let you zoom in on the city of your destination. From there, with links to other helpful Web sites, you can figure out what to do, where to stay, and where to eat. For a star-studded night in Toledo, try the Ritter Planetarium. ▶

talk is cheap best chat areas

NOTHING TO DO this Saturday night? Pull up a bar stool and join the Net's ongoing tête-à-tête. Those with the gift of gab can now log on for live text chats, or create avatars to speak for them in 3-D environments. Chats are *the* place to get the scoop on everything from recipes for ragout to the dirt on diaper rash. Here are our picks for the best places online to flap your jaws about politics, food, parenthood, movies, and computers.

Find Out Whether the Government Is Reading Your E-Mail (www.talk.com/talk/wiredside) Have a conspiracy theory to share? Join the Net pundits at HotWired's live text-based chat, who have more mud to rake than a worm farmer.

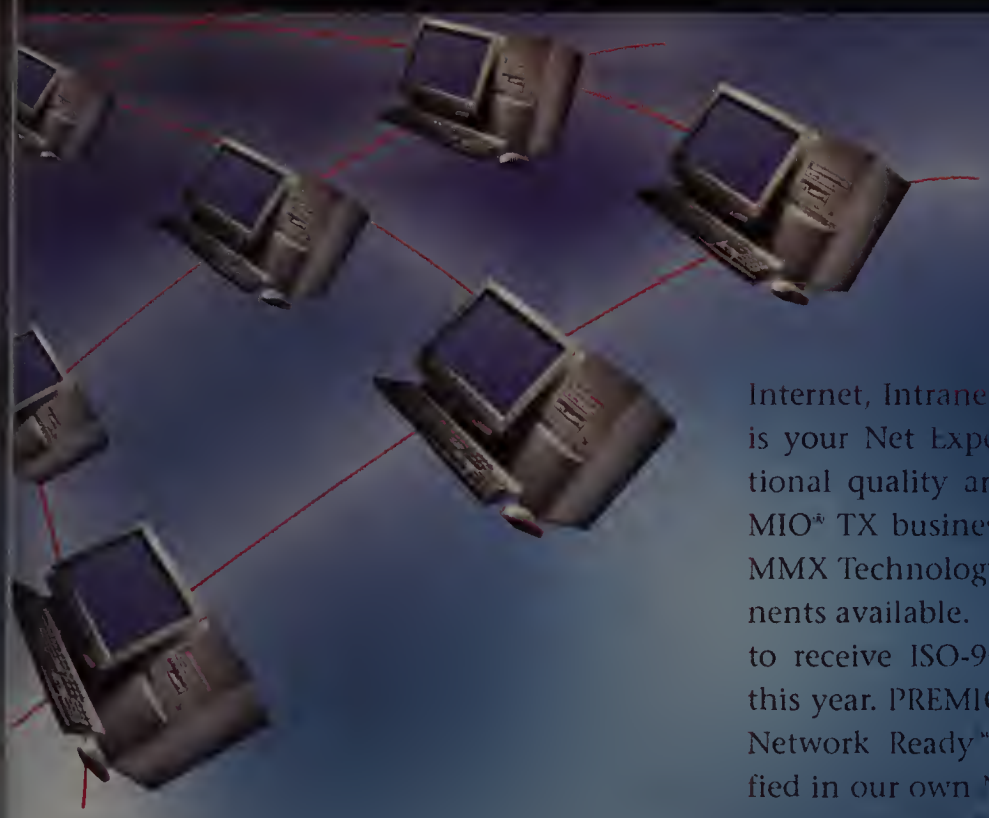
Find Out What Corn Smut Means (food4.epicurious.com/f_forums/f00_home/forums.html) Online home to *Gourmet* and *Bon Appetit*, Epicurious's threaded message boards are where virtual Martha Stewarts go to swap recipes and Tupperware. (Corn smut, by the way, is a fungus.)

Plot to Destroy Tickle Me Elmo (www.parentsoup.com) Wired and weary parents, rejoice! Parent Soup's real-time text chat is your one-stop resource for Gerbers and group therapy.

Argue About What Medication David Lynch Is On (www.mrshowbiz.com/chat/index.html) Text talk for film junkies of every stripe. Don't be caught dead here without knowing what Rosebud is.

Witness How All PC Talk Eventually Disintegrates Into Downright Naughtiness (www.thepalace.com) Come watch the computer geeks gather at this 3-D chat site to compare hard disks and hacking triumphs.

Find Out What's On Now (yack.com) If you're always worried there might be better conversations elsewhere on the Web, keep an eye on Yack, the *TV Guide* of live chat on the Internet. **–Shoshana Berger**



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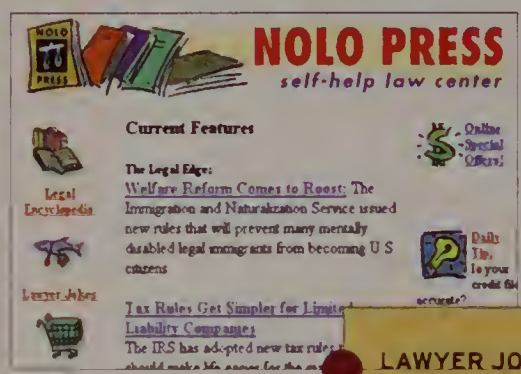

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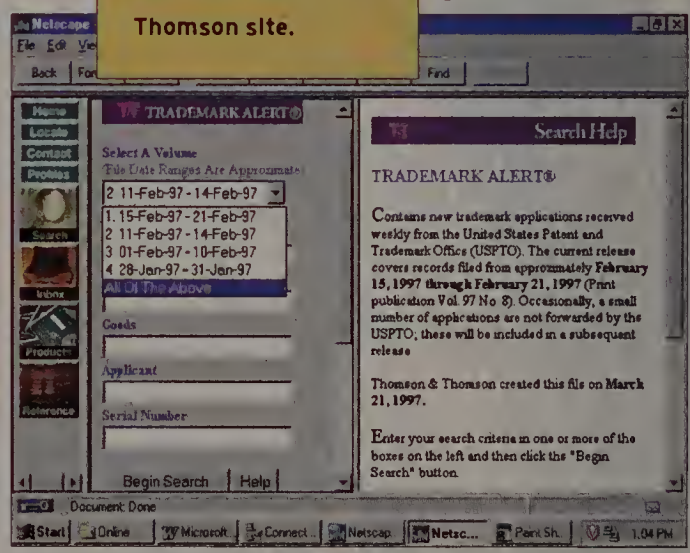

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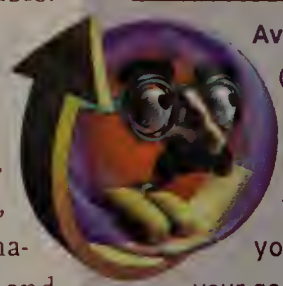

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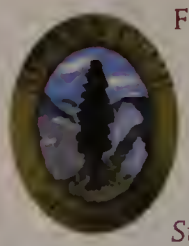

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online *Find additional information at www.pcworld.com/aug97/net.*

Shoshana Berger is an assistant editor for The Web; *Michael Cahlin is a freelance writer in Los Angeles; Matt Lake is a freelance writer in Ridley Park, Pennsylvania; Scott Spanbauer is a contributing editor for* PC World; *and Dylan Tweney is a senior editor for* InfoWorld. ■

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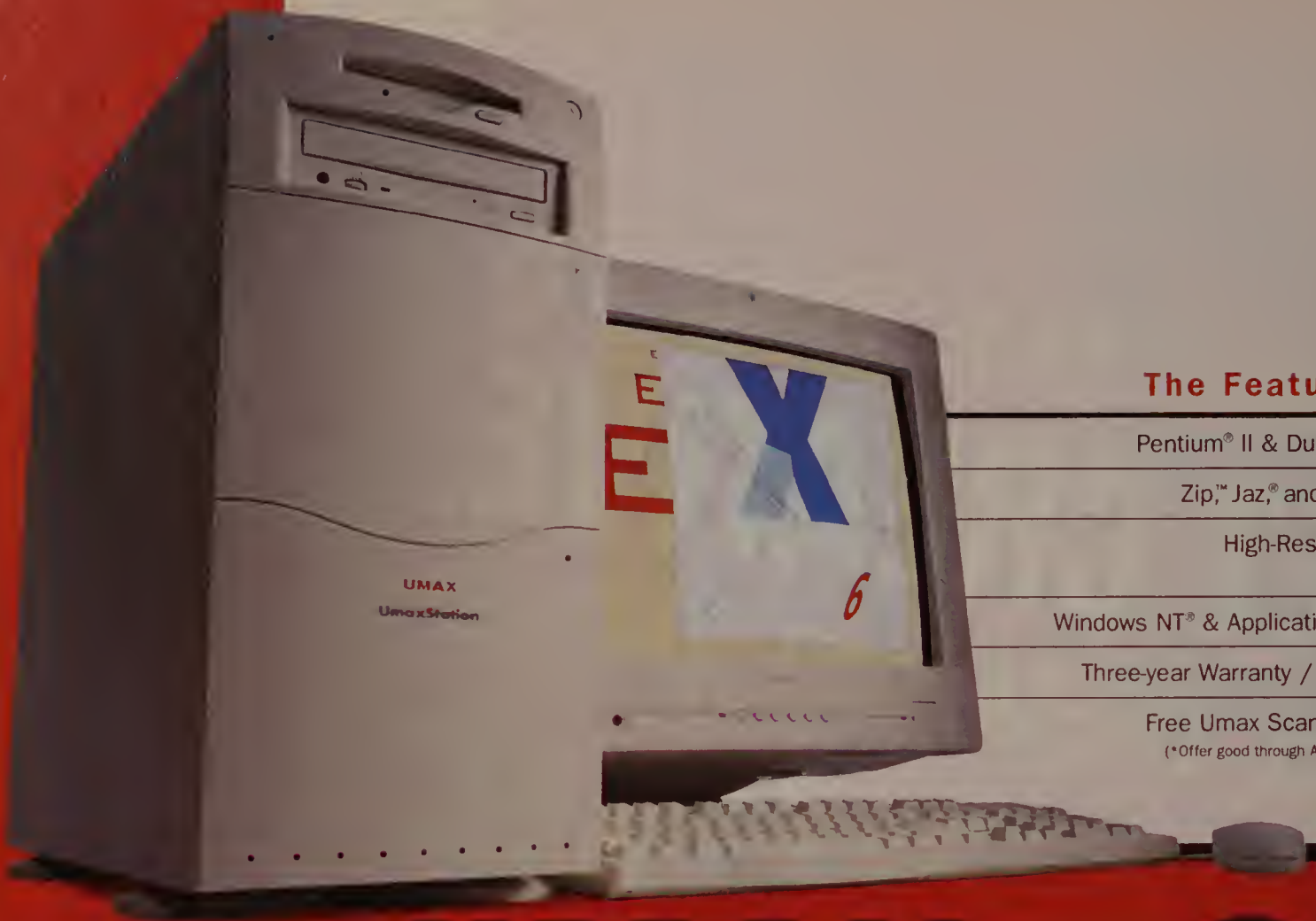

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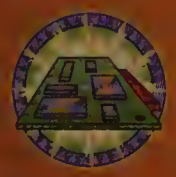
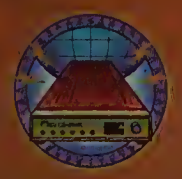
245 Monitors

249 Graphics Boards



251 Modems



CHIP WARS, Cheaper PCs

C-R-A-A-A-A-A-A-C-K. HEAR THAT? It's the sound of Intel's monopoly on processors beginning to buckle under pressure from competing CPU makers Advanced Micro Devices and Cyrix. The two ▶

EDITED BY REX FARRANCE AND ERIC HELLWEG

GATEWAY 2000'S G6-233: The first Pentium II-233 PC we've reviewed is a power Best Buy.

companies are ramping up production on the strongest selection of non-Intel CPUs available in years. If they can convince the big PC manufacturers to buy their processors instead of Intel's, the result may not be as dramatic as the fall of the Berlin Wall, but the ultimate impact on PC users will be far greater.

This month, five non-Intel–powered PCs appear on our Top 20 charts. These systems—including three based on AMD processors that rival the Pentium MMX-200 and MMX-166 in speed, and two that are based on Cyrix's older and slower 6x86-PR166+ chip—are just the tip of the iceberg. Next month, we will review our first AMD K6-PR233 system—from PC vendor Micro Express. Digital Equipment is the first top-tier system vendor to announce a K6-PR233 PC, and this CPU will compete head-to-head with Intel's new Pentium II. By the time you read this, Cyrix will be penetrating the power and budget categories with its 6x86MX processors (formerly code-named M2). These CPUs, initially available in 200- and 233-MHz flavors, compared well with Pentium MMX and Pentium II processors in early tests (see this month's *Top of the News*). Of course, AMD's and Cyrix's success with their new products will depend on how many of the major system vendors can be convinced to buy the new processors in large quantities.

But what's in it for you? Two things: First, the competition will force down the prices of Pentium MMX and Pentium II systems, so even if you stick solely with Intel-based PCs, you will pay less than you would if AMD and Cyrix weren't around. At the end of April, Intel slashed the price of its processors even as system manufacturers were waiting for new AMD and Cyrix CPUs to get into production. Second, it will become much easier to find really fast and loaded PCs for peanuts. For example, the new number eight system on our Budget Desktops chart this month, Micro Express's MicroFlex-K5/5166, with its AMD K5-PR166 processor, performs as fast as a Pentium-200 system and costs just $1349. If you consider only price/performance, it's the best deal on the chart.

FIRST MONITOR-TOP MODEM puts a mike where you want it.

TOP PERFORMANCE = PENTIUM II

THESE ALTERNATIVE CPUS notwithstanding, the fastest PCs on our Top 20s continue to be powered by Intel's 266-MHz Pentium II-266. And the fastest of the bunch is Dell's Dimension XPS H266—our top power desktop Best Buy for the second month in a row. At $3649, it's the third most expensive system, but it turned in an astounding PC WorldBench score of 263—more than 2½ times as fast as a Pentium-75. The chart's least expensive Pentium II is Gateway 2000's G6-233, which debuts at number four. It costs $760 less than the Dell, and you won't have to give up much speed: With a PC WorldBench score of 251, this 233-MHz Gateway is less than 5 percent slower.

The only power desktop PC based on a non-Intel CPU is Xi Computer's new K200 MTower, in 14th place. The MTower uses AMD's K6-PR200 chip; its PC WorldBench score of 227 compares with those of systems based on the Pentium MMX-200, and it's about 16 percent slower than the number one Dell.

The most common processor on the Power chart continues to be the Pentium Pro, the CPU for 7 of the 20 systems. That's a little surprising, given the faster performance of the newer Pentium II, but price cuts have kept the Pentium Pro in the game. We saw some substantial reductions last month, and this month both Dell and IBM cut the price of their Pentium Pro-200 systems by over $200. But don't expect Pentium Pros to get much cheaper; instead, with Intel's Pentium II and MMX processors selling briskly, Pentium Pro–based PCs will probably disappear from the Top 20 charts—and the market—by the end of the year.

In the coming months, the selection of powerful processors will get even more complicated. Intel will release a 300-MHz Pentium II late in the year and is expected to release a 233-MHz version of its Pentium MMX by the time you read this.

THE NEW HP DESKJET 1000C does 13-by-19-inch prints in living color.

Even if your bankroll is slim, you don't have to give up performance. There are five Pentium MMX-200 systems on our Budget Desktops chart this month, and one is a Best Buy: The $2149 Dell Dimension M200a is the slowest of the five—but it still turned in a very quick PC WorldBench score of 219. Even some of the least expensive PCs on our Budget chart have impressive speed. The CyberMax Cyrix Max C3 P166+ (powered by a Cyrix 6x86-PR166+ chip) had a PC WorldBench score of 205 and is priced at only $1399. (For comparison, an average Pentium-133 PC scores about 180.)

GETTING THE BIG PICTURE

THIS MONTH we tested four new state-of-the-art notebooks from Hewlett-Packard, IBM, and Toshiba; the latter has a 13.3-inch screen. But unless you're willing to pay $5000 or more for one of these machines, don't bother looking at them—it'll only break your heart. Using a notebook with a 13.3-inch screen is sort of like having a 14-inch monitor on your lap (only a lot more comfortable). Toshiba's Tecra 740CDT was the only new portable we tested that made the Power Notebooks chart—and just barely, at number ten.

At $5899, the Tecra 740CDT is the most expensive notebook to make our chart. Nevertheless, it's a swift Pentium MMX-166 machine with an outstanding array of features, including a fast 11X CD-ROM drive. The HP and IBM models are part of a wave of new notebooks designed as no-compromise desktop replacements. Each is a speedy MMX-166 loaded with RAM, storage, and multimedia features.

Six of the notebooks on the power chart this month are based on the MMX-166. Only one MMX notebook, CTX's new $2149 EZBook, has so far cracked the Budget chart, taking fourth place. But this dearth of low-cost MMX portables could change dramatically in the next few months. Intel has announced a mobile Pentium MMX-133 CPU that could translate into cheap, fast multimedia notebooks.

A final note on notebooks: We received late word that our number one budget Best Buy, the Compaq Armada 1130T, will be discontinued by the end of August.

BIG PRINTS

IF YOU NEED to print posters or large charts on oversize stock, consider HP's DeskJet 1000C, a wide-carriage personal printer we reviewed this month. At $499, it's too expensive to make our Top 10 Printers chart, but it prints good color images on paper up to 13 by 19 inches.

We also looked at Practical Peripherals' ProClass 336 V.34, the first monitor-top modem. This $159 device saves you desk space while putting a mike and speakers in front of you, right where you want them.

Rex Farrance is a senior associate editor and Eric Hellweg a staff editor for PC World. *Assistant Editor Grace Aquino, Editorial Researcher Julie Campagna, Editorial Assistant Mick Lockey, Associate Editors Melissa Riofrio and JoAnne Robb, and freelance writers Jon Jacobi, Todd Jatras, and Dan Littman contributed to the Top 100. Testing for the Top 100 by Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeffrey Kuta, Mike Salayko, and Susan Silvius. See page 14 for contact information.* ▶

YOUR GUIDE TO THE TOP 100

QUESTIONS ABOUT OUR CHARTS? The following section should answer most of them. If not, ask us; see page 14 for contact information.

How do the charts work? The Top 20 and Top 10 charts are evolving lists of the best PCs, monitors, modems, printers, and graphics boards we've tested. The Top 20 charts are divided by price. Power desktops cost $2500 or more; power notebooks cost $2750 or more. Every month we test the latest products in each category and compare them to the pool of items we've already reviewed. As new products earn places on the charts, those at the bottom drop off. Price cuts also cause chart changes.

Where do you get your prices? We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.

What does the overall rating mean? It's the sum of all our tests—both hands-on evaluations and automated speed tests. The scale is 1 to 100, so a product that scores in the 90s is generally considered exceptional, one in the 80s is among the best, one in the 70s is above average, and one that scores lower usually doesn't place.

What does the Top 20 PC WorldBench score mean? It's a measure of how fast a PC is in relation to our baseline machine, a Dell Dimension P75t configured with 8MB of RAM, a 540MB hard drive, and no secondary cache. A PC that scores 200, for instance, is twice as fast as the baseline unit.

Where do Top 20 scores for reliability, support quality, and support policies come from? The reliability and support quality scores come from readers who respond to the Reliability and Service fax-back survey in each issue of *PC World*. The policies score is based on the vendor's support policies (such as length of warranty and support hours).

What do all those word scores mean? Word scores for performance and price are based on a product's rating in relation to other products in its category. For example, a budget PC that is rated "expensive" is high-priced only compared to other budget PCs. Likewise, a power notebook rated "good" for performance is good only in relation to other power notebooks. Word scores for other categories, such as features, are relative to all desktops or all notebooks.

Where can I find the online version of the Top 100? Go to PC World Online (www.pcworld.com). There you'll find not only the current issue of *PC World* and reviews for the last 10 months, but also some extra features you'll want to check out. For example, PC World Online includes reviews you won't find in print. If a product misses a chart and we don't cover it here, you can go directly to an online review by using the URL provided in each Top 100 section.

Have you ever wished you could build your own chart based on your buying criteria? You can, with Buyer's Guide, our Web site's unique chart customizer. Buyer's Guide combines your criteria with *PC World*'s current data and test results to generate customized Top 20s and Top 10s. For instance, if you want your chart to rank notebooks that have 120-MHz processors and 1.6GB hard drives, Buyer's Guide will find and rank all the machines that fit your specifications.

PC WORLD

TOP 20 POWER DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (5/9/97)	CPU	Comments
1	Dell Dimension XPS H266 800/388-8542 www.dell.com	1	July 97	$3649	Pentium II-266	Ultrafast, superb multimedia; $120 higher but with Zip drive.
2	Dell Dimension XPS M200s 800/388-8542 www.dell.com	2	Mar 97	$2579	Pentium MMX-200	High-end MMX model is faster than similarly priced Pentium Pro.
3	Dell Dimension XPS Pro200n 800/388-8542 www.dell.com	3	Jan 97	$2549	Pentium Pro-200	$230 price drop enhances value of easily upgradable PC.
4	Gateway 2000 G6-233 800/846-2000 www.gateway.com	–	NEW	$2889	Pentium II-233	Fast, loaded; Ultra-DMA hard drive, Office 97; PII-266 also good value.
5	Dell OptiPlex GXi 200 800/388-8542 www.dell.com	4	Jun 97	$3255	Pentium MMX-200	Do-it-all corporate desktop has ethernet, multimedia, and voice modem.
6	Micron Millennia Pro2 200 B 888/634-8799 www.micronpc.com	5	Feb 97	$2738	Pentium Pro-200	Fast, loaded, reasonably priced; new Gateway bumps it from top five.
7	Dell OptiPlex GX pro 200 800/388-8542 www.dell.com	8	July 97	$3749	Pentium Pro-200	Closely matches speed of number five MMX-200 OptiPlex.
8	Micron Home MPC P200 888/634-8799 www.micron.com	–	Mar 97	$2518	Pentium-200	Former budget Best Buy now has Zip drive, slightly higher price.
9	Quantex QP6/266 SM-4x 800/896-4898 www.quantex.com	9	July 97	$2899	Pentium II-266	Blazing fast, comes with very sharp screen.
10	Gateway 2000 G6-266 800/846-2000 www.gateway.com	–	NEW	$2999	Pentium II-266	Business version of last month's G6-266 M doubles RAM; no modem or sound.
11	HP Vectra VA 6/200 MT 800/322-4772 www.hp.com	10	Mar 97	$3242	Pentium Pro-200	Nice corporate PC has top reliability record, but support hours are limited.
12	HP Pavilion 7370V 800/724-6631 www.hp.com	11	May 97	$3248	Pentium MMX-200	$200 drop, nice software bundle; only one year of free tech support.
13	Quantex QP6/200 SM-4 800/896-4898 www.quantex.com	12	May 97	$2649	Pentium Pro-200	Nimble business PC saves you $250 over faster Pentium II at number nine.
14	Xi Computer Xi K200 MTower 800/432-0486 www.xicomputer.com	–	NEW	$2549	AMD K6-PR200	New, affordable AMD K6-based PC is fast, loaded; great software bundle.
15	Sys Technology Sys Performance P200T2M 800/613-9963 www.systechnology.com	13	July 97	$2657	Pentium MMX-200	Speedy; sharp monitor; components bear warranties from one to six years.
16	CLR Infinity PT5-A 200 MMX 800/611-1555 www.clrusa.com	17	Apr 97	$2629	Pentium MMX-200	Fast, inexpensive, has good support policies; relatively small monitor.
17	IBM PC 365 800/426-2968 www.pc.ibm.com	–	Mar 97	$4221	Pentium Pro-200	$254 cut puts classy business PC with rewritable optical drive back on chart.
18	Acma EXP 200 800/786-6888 www.acma.com	–	NEW	$2595	Pentium MMX-200	Affordable, plenty of performance, comes with CorelDraw; support limited.
19	Sys Technology Sys Performance Pro 200 800/613-9963 www.systechnology.com	15	Dec 96	$2849	Pentium Pro-200	Good graphics card, generic; parts warrantied from one to six years.
20	Sys Technology Sys Performance Pro 266 800/613-9963 www.systechnology.com	18	July 97	$4299	Pentium II-266	Superfast, relatively expensive; components warrantied from one to six years.

Best Buy See features chart, page 212; performance chart, page 214. Recommended as home system

[1] Insufficient data.

THREE NEW SYSTEMS BASED ON Pentium II and AMD chips duke it out on this month's Power Desktops Top 20. Of these newcomers, Gateway's $2889 G6-233, the first 233-MHz Pentium II that we've reviewed, emerged the winner, with a fourth-place Best Buy earned on the strength of terrific performance and a powerhouse configuration. We also reviewed an Intergraph Pentium II-266 PC configured for high-end corporate work and an NEC Pentium MMX-166 that's well set up for the home office. The former wasn't fast enough to land on our chart; the latter was too expensive. To read about the PCs that didn't make this month's Power chart, visit PC World Online (www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	PC WorldBench score/performance	Vendor's system reliability	Features and design	Price	Vendor's support quality/policies	Reader service number
94	263/outstanding	best	outstanding	expensive	best/best	656
93	234/very good	best	very good	very inexpensive	best/best	657
93	230/very good	best	very good	very inexpensive	best/best	658
91	251/outstanding	fair	outstanding	inexpensive	best/best	659
90	226/very good	best	outstanding	average	best/best	660
88	231/very good	good	very good	inexpensive	best/best	661
87	230/very good	best	good	average	best/best	662
87	216/good	good	very good	very inexpensive	best/best	663
86	259/outstanding	fair	good	inexpensive	good/best	664
86	258/outstanding	fair	good	inexpensive	best/best	665
86	229/very good	best	very good	average	good/fair	666
82	222/very good	best	good	average	good/fair	667
82	230/very good	fair	good	inexpensive	good/best	668
81	227/very good	¹	very good	very inexpensive	¹/good	669
81	233/very good	¹	very good	inexpensive	¹/fair	670
81	229/very good	¹	very good	very inexpensive	¹/good	671
79	232/very good	fair	outstanding	very expensive	good/best	–
79	233/very good	¹	very good	very inexpensive	¹/fair	672
79	236/outstanding	¹	very good	inexpensive	¹/fair	673
79	262/outstanding	¹	outstanding	very expensive	¹/fair	674
Scorecard weightings ▶	Performance 25 percent	Reliability 25 percent	Features 20 percent	Price 15 percent	Support 15 percent	All products: 907

This Month's Best Buys

1 DELL DIMENSION XPS H266

PRO: Lightning fast, fine features, top-notch support policies and service and reliability ratings

CON: Pricey, case cover is hard to remove

If Dell's $3649 Dimension XPS H266 is any indication, the Pentium II processor deserves all the fanfare it's been getting. This terrific home-office system ran up a PC WorldBench score of 263—one of the best we've seen to date.

The Dimension XPS H266 is a high-end machine in all respects. The H266's Matrox Millennium II card, a habitué of our monthly Top 10 Graphics Boards chart, is among the first to have 8MB of video memory, which will appeal to anyone who wants to do 3-D modeling. The 17-inch monitor produces exceptionally crisp text and graphics. The fast 12X CD-ROM drive, wavetable-equipped Yamaha sound card, and Altec Lansing ACS 90 speakers with ACS2 90 subwoofer comprise a great multimedia setup.

Dell Dimension XPS H266

The H266 comes with a huge 6.4GB hard drive, plus all the communications components a home office needs, including a voice-enabled 3Com U.S. Robotics 33.6-kbps modem. And Microsoft Office Small Business Edition is in the software bundle. This is also one of a few systems to sport an Iomega Zip drive, which accepts 100MB floppy-style disks.

Our biggest complaint is the documentation, which is split into separate booklets for the main system and each peripheral. While these manuals are excellent, they'd be handier if integrated into one package. Also, though you can hand-turn a large screw to remove the minitower's side panel, pulling the panel off and putting it back on takes some finagling.

Dell's excellent reliability and service complete the picture. *PC World* readers continue to report high satisfaction with both in our ongoing fax-back survey.

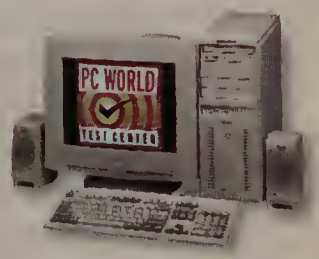
2 DELL DIMENSION XPS M200S

PRO: Very fast; components, software bundle, service quality, and reliability rating are all tops

CON: Maximum RAM limited to 64MB

This Pentium MMX-200 minitower has a winning combination of speed, high-quality components, good design, and top-rated service. And its price is great: At $2579, it very nearly qualifies for our Budget chart.

With a WorldBench score of 234, this general business system is faster than most Pentium Pro PCs, and the Pentium Pro doesn't use MMX technology. The multimedia setup is great, including Altec Lansing's ACS 290 speakers with subwoofer. A 3.2GB hard drive ▶



Dell Dimension XPS M200s

TOP 20 POWER DESKTOPS — STANDARD FEATURES

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS H266*	Pentium II-266	32	512	6.4	Matrox Millennium II	8/WRAM	17/15.9	.25	12X
2	Dell Dimension XPS M200s*	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/WRAM	17/15.8	.28	12X
3	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	3.2	Number Nine Imagine 128 II	4/VRAM	17/15.6	.28	12X
4	Gateway 2000 G6-233*	Pentium II-233	64	512	3.2	STB Virge 4MB 3D PCI	4/VRAM	17/15.9	.28	16X
5	Dell OptiPlex GXi 200*	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/VRAM	17/16	.28	8X
6	Micron Millennia Pro2 200 B	Pentium Pro-200	32	256	3.1	Diamond Stealth 3D 2000	4/EDO DRAM	17/16	.26	16X
7	Dell OptiPlex GX pro 200	Pentium Pro-200	32	512	3.2	Matrox Millennium	4/WRAM	17/15.8	.28	8X
8	Micron Home MPC P200	Pentium-200	32	512	2.1	Diamond Stealth 3D/Monster	4/EDO DRAM	17/16	.26	16X
9	Quantex QP6/266 SM-4x	Pentium II-266	32	512	4.3	Matrox Millennium II	4/WRAM	17/16	.25	12X
10	Gateway 2000 G6-266	Pentium II-266	64	512	6.4	STB Virge 4MB 3D PCI	4/VRAM	17/16	.28	16X
11	HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	2.5	Matrox Millennium	2/WRAM	17/15.7	.28	8X
12	HP Pavilion 7370V	Pentium MMX-200	32	256	4	integrated	2/EDO DRAM	17/15.7	.28	16X
13	Quantex QP6/200 SM-4	Pentium Pro-200	32	256	3.2	Matrox Millennium	4/WRAM	17/16	.26	12X
14	Xi Computer Xi K200 MTower	AMD K6-PR200	32	512	5.1	STB Nitro 3D	4/EDO DRAM	17/16.1	.26	16X
15	Sys Technology Sys Performance P200T2M	Pentium MMX-200	32	512	3.2	Diamond Stealth 3D 3000	4/VRAM	17/15.8	.26	12X
16	CLR Infinity PT5-A 200 MMX	Pentium MMX-200	32	512	3.2	Number Nine Imagine 128	4/VRAM	15/13.7	.28	12X
17	IBM PC 365	Pentium Pro-200	32	256	2.1	Matrox Millennium	4/WRAM	17/15.7	.28	6X
18	Acma EXP 200	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/WRAM	17/15.9	.25	12X
19	Sys Technology Sys Performance Pro 200	Pentium Pro-200	32	256	2.5	Matrox Millennium	2/WRAM	17/15.8	.26	12X
20	Sys Technology Sys Performance Pro 266	Pentium II-266	32	512	4.3	Matrox Millennium	4/WRAM	17/15.8	.28	12X

* Best Buy [1] Download only, uploads at 33.6-kbps; uses U.S. Robotics' x2 technology. [2] Five years on CPU and main RAM, three years on other parts. [3] Toll call. [4] First year.

provides ample storage. Communications are handled by a 3Com USR 33.6-kbps voice-enabled modem and Vocal Point voice/fax/data software. Microsoft Office Professional also comes bundled with the M200s. The system's 4MB Matrox Millennium card, while not a high-end, workstation-class board, is excellent for general graphics chores. Keep in mind that the M200s is limited to 64MB of system memory—only half the amount most PCs can take. Users of programs such as Photoshop and other demanding graphics software would be better off with the Dimension XPS Pro200n.

The case opens with just the turn of a thumbscrew, though the side panel can be a bit sticky. The interior is impeccably clean, with plenty of free slots and bays.

Dell's system documentation is thorough and easy to understand, and the company's support policies are extensive, although its labor warranty recently dropped from three years to one. Dell's system reliability rates among the best, according to *PC World* readers.

3 DELL DIMENSION XPS PRO200N

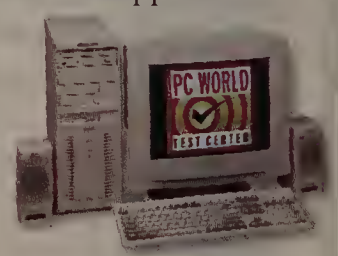
PRO: Very fast, has both top reliability rating and excellent support

CON: None significant

A $230 price cut this month makes the $2549 XPS Pro200n an even better choice for a Windows NT workstation. The price includes a Pentium Pro-200 processor and a high-end graphics card—the Number Nine Imagine 128 II—plus 256K of secondary cache.

The Pro200n uses the same minitower case as the number two M200s. The CD-ROM drive is at the top of the front panel, making it easily accessible. The interior is roomy, and the four free slots and four free bays are easy to get to.

The support policies for this system mirror those of its XPS M200s sibling: You get a three-year parts warranty and one year of coverage for labor, along with round-the-clock toll-free support that garners a great rating in our fax-back surveys. Our readers also give Dell consistently excellent ratings for system reliability.



Dell XPS Pro200n

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
33.6	integrated Yamaha OPL3-Sax	minitower	128	512	2	2/1	4	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	integrated Vibra 16	minitower	64	512	1	2/1	3	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	Sound Blaster AWE 32	minitower	128	256	2	3/1	4	3/1	24	Sat., Sun.	BBS, CIS, WWW
56 [1]	Ensoniq Audio PCI Wavetable	minitower	256	512	2	3/2	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
33.6	integrated Vibra	desktop	512	512	3	1/0	3	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	integrated Sound Blaster 32	minitower	512	512	3	3/0	4	3 [2]/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	Creative Labs Vibra 16	desktop	512	512	3	1/1	3	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	Sound Blaster AWE 32	minitower	128	512	2	3/1	3	3 [2]/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	integrated Yamaha OPL3-Sax	tower	128	512	0	3/3	4	3/1	24	Sat., Sun.	BBS, WWW
–	–	minitower	128	512	2	2/2	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
–	Sound Blaster PnP	minitower	192	256	4	2/1	4	3/3	11 [3]	–	AOL, BBS, CIS, WWW
33.6	integrated Yamaha	minitower	128	256	2	2/2	5	1/1	24 [3]	Sat., Sun.	AOL, BBS, CIS, WWW
33.6	Ensoniq Soundscape Vivo-90	minitower	128	256	0	3/3	4	3/1	24	Sat., Sun.	BBS, WWW
33.6	Addonics Soundvision 510	minitower	128	512	7	4/1	4	3/3	11.5	Sat.	WWW
33.6	Sound Blaster 32	minitower	512	512	4	3/2	4	varies	24 [4]	Sat., Sun.	–
28.8	Sound Blaster AWE 32	minitower	256	512	2	2/0	5	3/3	12	Sat.	WWW
–	–	desktop	512	256	3	0/1	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, WWW
33.6	integrated	minitower	128	512	2	1/1	4	3/1	10	–	BBS, WWW
33.6	Sound Blaster 32 PnP	minitower	128	512	2	3/1	4	varies	24 [4]	Sat., Sun.	–
33.6	Sound Blaster 32 PnP	minitower	512	512	4	3/2	2	varies	24 [4]	Sat., Sun.	–

4 GATEWAY 2000 G6-233

PRO: Fast, excellent documentation, nice design

CON: Drive bays can be tough to access

If the jury is out on how well the Pentium II-233 will do compared with the new Pentium MMX-233 PCs we're reviewing next month, the Gateway 2000 G6-233 leaves no question about its value: It's clearly an outstanding deal. This blazingly fast Pentium II-233 minitower costs only $2889. The first 233-MHz Pentium II we've reviewed in the Top 20, it was nearly as fast as 266-MHz PCs we tested, yet it costs almost $600 less than the average Pentium II-266 system we've looked at to date. With 64MB of EDO RAM and 512K of cache, the G6-233 scored 251 on our PC WorldBench performance tests—about 4 percent behind the average score for PCs with a Pentium II-266. The G6-233 is a sturdy, stylish multimedia system that's suitable for power home and business use.

Our test system came with a 16-bit Ensoniq Audio PCI Wavetable sound card, Altec Lansing speakers with a subwoofer, and an STB Virge 4MB 3D PCI graphics card. Gateway adds another first, a 3.2MB Ultra-DMA hard drive, which doubles the top data transfer rate. The company also includes a 56-kbps x2 modem for fast data communications.

Gateway 2000 G6-233

The system looks unusual: Soft edges and a slight "billowing" effect lend some grace to this minitower. The large thumbscrews make getting inside the case for repairs or upgrades very easy. We also like the use of color-coded I/O ports.

Our unit had plenty of expansion room, and the cables were all neatly bundled. The drawbacks were minor: We had to unscrew thumbscrews on the case's right side panel to remove the drive cages, and the hard drive already occupies the most accessible of the internal drive bays.

Gateway's documentation is great, as always—complete, clear, and easy to read.

Readers rank Gateway's system reliability as only fair, but they also rate support quality as top-notch. You get three-year parts and labor warranties and round-the-clock toll-free tech support. ▶

5 DELL OPTIPLEX GXI 200

PRO: Fast; above-average service, support, and system reliability

CON: Expensive, limited expandability

Like all OptiPlex models, this $3255 MMX-200 desktop isn't for the faint of budget: It costs $676 more than the number two Dimension XPS M200s. But it has everything you need in a high-end corporate machine—snappy performance, bountiful storage, built-in networking, and great support. The Dell D1728D-LS monitor isn't Dell's top 17-inch model; for an extra $100, you can move up to a 17HS Trinitron, which displays even sharper text and provides more on-screen controls.

The GXi 200 is particularly well designed. Expansion slots sit on a daughtercard above the motherboard; we found plugging cards into them as painless as it gets. Our only beefs: With just one available external drive bay, one free 32-bit slot, and two 16-bit slots, the expansion options are a bit tight.

Dell OptiPlex GXi 200

As with all OptiPlexes, support is great. Dell backs the GXi with a three-year warranty on parts and one year on labor. ▶

TOP 20 POWER DESKTOPS

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Dimension XPS H266*	Pentium II-266	32	512	263
2	Dell Dimension XPS M200s*	Pentium MMX-200	32	512	234
3	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	230
4	Gateway 2000 G6-233*	Pentium II-233	64	512	251
5	Dell OptiPlex GXi 200*	Pentium MMX-200	32	512	226
6	Micron Millennia Pro2 200 B	Pentium Pro-200	32	256	231
7	Dell OptiPlex GX pro 200	Pentium Pro-200	32	512	230
8	Micron Home MPC P200	Pentium-200	32	512	216
9	Quantex QP6/266 SM-4x	Pentium II-266	32	512	259
10	Gateway 2000 G6-266	Pentium II-266	64	512	258
11	HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	229
12	HP Pavilion 7370V	Pentium MMX-200	32	256	222
13	Quantex QP6/200 SM-4	Pentium Pro-200	32	256	230
14	Xi Computer Xi K200 MTower	AMD K6-PR200	32	512	227
15	Sys Technology Sys Performance P200T2M	Pentium MMX-200	32	512	233
16	CLR Infinity PT5-A 200 MMX	Pentium MMX-200	32	512	229
17	IBM PC 365	Pentium Pro-200	32	256	232
18	Acma EXP 200	Pentium MMX-200	32	512	233
19	Sys Technology Sys Performance Pro 200	Pentium Pro-200	32	256	236
20	Sys Technology Sys Performance Pro 266	Pentium II-266	32	512	262

*Best Buy

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing).

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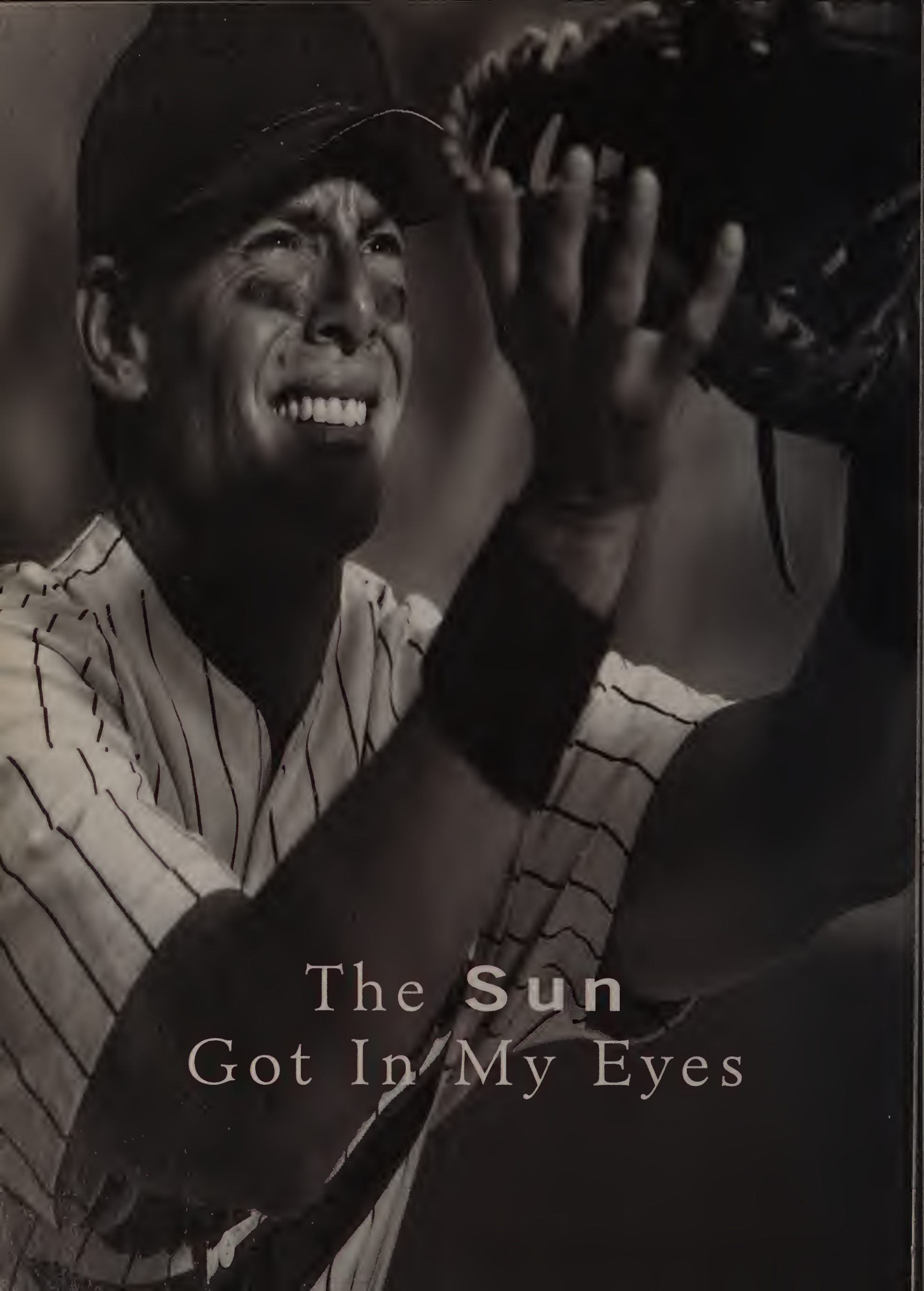
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New This Month

The following PCs made our Power Desktops chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

10 GATEWAY 2000 G6-266

PRO: Fast; solid construction, relatively inexpensive, terrific documentation

CON: Sound card, modem are extra

Gateway 2000's G6-266—one of the vendor's corporate PCs—is basically the same as the G6-266 M reviewed last month, but without modem, sound, or speakers. At $2999, it costs $110 more than the multimedia- and communications-ready G6-233 at number four, and with a PC WorldBench rating of 258, it's only about 3 percent faster. Compared with other Pentium II-266s we've reviewed so far, however, it is still a good deal.

Gateway 2000 G6-266

Our test unit came with 64MB of RAM; a fast, cavernous 6.4GB Ultra-DMA hard drive; and a 17-inch CrystalScan monitor (not as good as Gateway's Vivitron 700, which adds only $100 to the price). The graphics adapter is an STB Virge with 4MB of VRAM.

As with the Gateway G6-233 reviewed above, the G6-266 is sturdy and cleanly designed, inside and out—and the documentation and warranty are every bit as good. Toll-free tech support is available 24 hours a day. Gateway's support is rated as among the best available by readers in our fax-back survey, but its system reliability is ranked only fair.

14 XI COMPUTER XI K200 MTOWER

PRO: Clean design, big hard drive, low price

CON: Limited support, meager documentation

For a low $2549, Xi Computer's Xi K200 MTower delivers impressive speed, plenty of memory and storage, and a nice video and sound system. The box may be generic, but its contents aren't. AMD's new K6-PR200 processor kicks this system along to a PC WorldBench score of 227—comparable to some Pentium MMX-200s, though a similarly configured AMD K6-200 system from Sys Technology scored 238. The STB Nitro 3D video card with 4MB of EDO DRAM matches up well with the OptiQuest V773 monitor to deliver a good picture. The Altec Lansing ACS 45 speakers add a subwoofer to enhance the low end, and the Addonics Soundvision 510 16-bit sound card does a fair job of delivering audio. A 16X CD-ROM drive from Hitachi and a 33.6-kbps U.S. Robotics Sportster Voice 33.6 fax-modem (software-upgradable to 56 kbps) round out the system.

Xi Computer Xi K200

Even with all the multimedia extras, there's plenty of room for more peripherals and storage. The interior is tailor-made for expansion: Cards and memory sockets are easy to reach, with no clutter in the way.

Unfortunately, the documentation is another story. It's too technical and generic, and it consists of Windows 95 documents, vendor-supplied manuals for the peripherals, and sparse setup instructions. Xi's support policies aren't bad, with three-year parts and labor coverage, toll-free tech support available 11.5 hours every day except Sundays, and free on-site service for the first year.

18 ACMA EXP 200

PRO: Nice performance, very tidy interior

CON: Scant software bundle, no weekend support

Don't be fooled by the nondescript beige casing of the Acma EXP 200. Inside the unit are all the components you'll need for speed and multimedia. This $2595 minitower performed well in our tests with a PC WorldBench score of 233, which puts it on a par with the average of the Pentium MMX-200 machines that we've tested. Its software bundle, however, is on the skimpy side.

Acma's latest system comes well equipped for a small office or home office, with 32MB of RAM and a 3.2GB hard drive. Its Matrox Millennium graphics card—one of the best in its class—offers 4MB of fast WRAM and drives 3-D images to the system's 17-inch monitor, which displays them brilliantly. The monitor also has an on-screen menu that makes adjustments a breeze. Other multimedia perks include a first-rate 33.6-kbps U.S. Robotics modem (a perennial contender on our Top 10 Modems chart), a 12X CD-ROM drive, and speakers. The machine's slim software bundle includes Kodak Colorific and the excellent CorelDraw 4, but that's about it. We'd like to see more bundled software with a system that's so geared toward multimedia use.

The EXP 200's chassis flexes a little bit, although it's sturdy with the cover on, and its thumbscrews make for easy removal for upgrades and servicing. The keys have a slightly mushy feel.

The interior of this computer is exceptionally tidy. The cables are neatly tucked away, so you have easy access to the two free PCI slots, one shared PCI/ISA slot, and one free ISA slot. For memory upgrades, two SIMM sockets are also available, and are easy to get to. The unit is a little stingy on drive bay space, however, with just two bays available. On the back of the machine, you'll find the I/O ports clearly labeled.

There's room for improvement in service and support. For instance, while Acma provides a three-year parts and one-year labor warranty, it gives short shrift to answering technical questions. Tech support is available for only 10 hours each weekday. That might not bother you if you have a system expert on your site, but it's sure to confound home users and novices. The user manual is also below par, covering only basic setup instructions. ▶

Acma EXP 200

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Power Desktops chart. For write-ups, see PC World Online (www.pcworld.com/t20pcsnaps).

- **Intergraph TD-225**
- **NEC Ready Office 1715**
- **Total Peripherals Archer 2000A**

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Five 4GB Ultra-Wide SCSI-3 hard drives (20GB total)

STANDARD FEATURES

512KB integrated L2 cache
Mylex dual channel Ultra SCSI-3 RAID caching controller with 4MB RAM
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
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Integrated SVGA graphics
12X variable speed SCSI CD-ROM drive, 3.5" floppy drive
5 internal, hot-swappable, hard drive array bays (upgradable to 10)
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Microsoft Windows NT® Server 4.0 (10-user license)
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NOS Support (3 incident resolutions/ 1st year), 7x24

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MICRON VETIX MXI

Intel 200MHz Pentium Pro processor
128MB ECC EDO RAM
Three 4GB Ultra-Wide SCSI-3 hard drives (12GB total)

STANDARD FEATURES

256KB integrated L2 cache
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12X variable speed SCSI CD-ROM drive
3.5" floppy drive
5 internal, hot-swappable, hard drive array bays (upgradable to 10)
3 external 5.25" media bays
1 (one) 330 watt power supply standard (upgradable to 3 for added redundancy)
Microsoft Mouse, 104-key keyboard
Microsoft Windows NT Server 4.0 (10-user license)
Intel LANDesk Server Manager 2.52
Integrated hardware instrumentation
Dedicated server technical support, 7x24
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MICRON VETIX LXI-N

Intel 200MHz Pentium Pro processor
32MB ECC EDO RAM
2GB Ultra-Wide SCSI-3 hard drive

STANDARD FEATURES

Dual Pentium Pro ZIF sockets
256KB integrated L2 cache
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12X SCSI-2 CD-ROM drive
3.5" floppy drive
9 drive bays: 6 internal 3.5", 3 external 5.25"
Microsoft Mouse, 104-key keyboard
Integrated hardware instrumentation
Dedicated server technical support, 7x24
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Seagate Backup Exec	$249
Novell IntranetWare 4.11 (5-user license, for Vetix LXI-N only)	$69

intel inside
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- [illegible]5" Micron 15FGx, .28dp (13.7" display)

STANDARD FEATURES

- [illegible]12KB pipeline burst cache, flash BIOS, DMI Support
- [illegible].5" floppy drive
- [illegible]Com 3C905 network adapter
- [illegible]ntegrated S3 ViRGE/DX graphics [illegible] accelerator, 2MB EDO RAM
- [illegible]ntegrated wavetable sound
- [illegible]ool-free minitower or desktop
- [illegible]icrosoft Intellimouse,™ 104-key keyboard
- [illegible]icrosoft Windows® 95
- [illegible]ntel LANDesk Client Manager
- [illegible]-year/3-year Micron Power limited warranty

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PC WORLD

TOP 20 BUDGET DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (5/9/97)	CPU	Comments
1	Dell Dimension XPS M166s 800/388-8542 www.dell.com	1	July 97	$2279	Pentium MMX-166	Speedy, very big hard drive, good graphics, fast modem, top reliability rating.
2	Dell Dimension M200a 800/388-8542 www.dell.com	3	June 97	$2149	Pentium MMX-200	Quick, well-rounded, with top reliability and service ratings.
3	Gateway 2000 G5-166 M 800/846-2000 www.gw2K.com	–	NEW	$1779	Pentium MMX-166	Fast, affordable, fast modem, full multimedia; spring for a better monitor.
4	IBM PC 350 (Pentium-166) 800/426-2968 www.pc.ibm.com	7	Dec 96	$1715	Pentium-166	$277 drop, great networking features on corporate PC; slow CD-ROM drive.
5	Dell OptiPlex Gs+166 800/388-8542 www.dell.com	4	June 97	$2018	Pentium-166	Attractively priced corporate PC with standard Pentium.
6	Quantex OP5/166 SM-3 800/896-4898 www.quantex.com	–	NEW	$1899	Pentium MMX-166	Quick for Pentium MMX-166, full multimedia, good graphics, 33.6-kbps modem.
7	HP Pavilion 5320 800/724-6631 www.hp.com	10	June 97	$1848	Pentium-150	High reliability rating, comes with good software bundle; on slow side.
8	Micro Express MicroFlex-K5/5166 800/989-9900 www.microexpress.net	–	NEW	$1349	AMD K5-PR166	Long warranty, great price; except for monitor, mostly generic components.
9	Midwest Micro MWH-200 800/728-8582 www.mwmicro.com	12	Feb 97	$1889	Pentium-200	$140 price cut this month, full multimedia, 33.6-kbps modem.
10	Micro Express MicroFlex-PCI/5166 800/989-9900 www.microexpress.net	–	Dec 96	$1699	Pentium-166	Quick for a P-166, good graphics card and monitor, long warranty; no apps.
11	Quantex OP6/200 PD-4 800/896-4898 www.quantex.com	–	Feb 97	$2459	Pentium Pro-200	Fastest on chart, comes with good modem and load of software; pricey.
12	HP Vectra VE 5/133 800/322-4772 www.hp.com	11	Dec 96	$1705	Pentium-133	Corporate PC with nice touches; Unified Memory Architecture slows it down.
13	CyberMax Cyrix Max C3 P166+ 800/437-4956 www.cybmax.com	14	Feb 97	$1399	Cx6x86-PR166+	$100 price drop, full multimedia, 33.6-kbps modem; support hours limited.
14	Polywell Poly 5000X 800/999-1278 www.polywell.com	18	June 97	$1598	AMD K5-PR166	P-200 zip for peanuts, home software, full multimedia, good warranty.
15	Kingdom 6x86 P166+ Super Value 800/385-3436 www.kingdomcomputers.com	13	May 97	$1297	Cx6x86-PR166+	Least expensive here, reasonably fast, has 16X CD-ROM drive but no modem.
16	Quantex OP5/200 M-4 800/896-4898 www.quantex.com	–	June 97	$2349	Pentium MMX-200	Speedy, nice software bundle, full multimedia, fast modem; pricey.
17	Kingdom Pentium MMX 200 Home & Office 800/385-3436 www.kingdomcomputers.com	–	July 97	$2297	Pentium MMX-200	$100 price cut, second fastest on chart, full multimedia, 33.6-kbps modem.
18	ProGen Atlas X 200 888/776-9595 www.progen.com	–	NEW	$1999	Pentium MMX-200	Terrific speed, affordable, has it all, including speakers, subwoofer.
19	CyberMax Max I6/P200MMX 800/443-9896 www.cybmax.com	16	July 97	$2199	Pentium MMX-200	Very fast, full multimedia, 33.6-kbps modem, very large hard drive.
20	DirectWave P133 MVP Pro 800/882-8108 www.directwave.com	17	Oct 96	$1549	Pentium-133	One of faster Pentium-133s we've tested, full multimedia, well built.

Best Buy See features chart, page 224; performance chart, page 226. Recommended as home system

[1] Insufficient data. [2] Limited data; score is based on responses for this company and average of all companies.

THE BUDGET CHART IS THE LAST bastion of the standard (non-MMX) Pentium. This month the Pentium-166 version of IBM's business PC, the PC 350, rode a big price drop of $277 to a number four Best Buy. But if you want one, act soon: Plain old Pentium machines won't be available much longer. Of ten systems that didn't make the chart, the AMD K6-PR200–based Sys Technology Sys Performance 200K6 had the most impressive speed, but a fairly high price kept it off the list. We also reviewed new AST Pentium MMX-166 and DTK Pentium MMX-200 models. For more on these and other systems that didn't make the Budget Top 20, visit PC World Online (www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	Price	Vendor's system reliability	Features and design	PC WorldBench score/performance	Vendor's support quality/policies	Reader service number
86	expensive	best	very good	223/very good	best/best	675
85	average	best	very good	219/very good	best/best	676
82	inexpensive	fair	very good	213/very good	best/best	677
82	inexpensive	fair	outstanding	197/good	good/best	–
80	average	best	satisfactory	198/good	best/best	678
80	average	fair	very good	218/very good	good/best	679
79	average	best	good	180/good	good/fair	680
79	very inexpensive	[1]	good	208/good	[1]/best	681
79	average	fair [2]	very good	210/very good	good [2]/fair	682
78	inexpensive	[1]	good	212/very good	[1]/best	683
78	expensive	fair	very good	235/outstanding	good/best	684
78	inexpensive	best	good	166/satisfactory	good/fair	685
78	very inexpensive	[1]	good	205/good	[1]/good	686
77	inexpensive	[1]	good	213/very good	[1]/best	687
77	very inexpensive	[1]	good	197/good	[1]/good	688
76	expensive	fair	very good	221/very good	good/best	689
76	expensive	[1]	outstanding	233/outstanding	[1]/good	690
76	average	[1]	very good	232/outstanding	[1]/fair	691
76	expensive	[1]	very good	230/very good	[1]/good	692
76	inexpensive	[1]	very good	194/good	[1]/best	693
Scorecard weightings ▶	Price 25 percent	Reliability 25 percent	Features 20 percent	Performance 15 percent	Support 15 percent	All products: 908

This Month's Best Buys

1 DELL DIMENSION XPS M166S

PRO: Terrific speed, great reliability and support

CON: Relatively high price

If you're shopping for a home office system that gives you the most for your money, put the XPS M166s on your short list. It's superfast (its PC WorldBench score is 223), comes with a set of components that reads like a Who's Who of our Top 10 charts, and is backed by excellent support. No PC is without its weak points, but this has only one: a relatively high $2279 price.

Using a less expensive graphics board is one way that Dell could have cut the cost—the 15-inch monitor is too small to take full advantage of the ultrahigh resolutions possible with the 4MB Matrox Millennium graphics card. Even so, the XPS M166s is a superb deal.

Dell Dimension XPS M166s

It comes with a spacious 4.3GB hard drive and a 33.6-kbps 3Com USR Sportster Voice modem, one of the more highly rated modems *PC World* has tested.

Its software bundle makes this PC a nice choice for a small business or home office. Besides the Vocal Point communications package, Dell includes Microsoft Office Small Business Edition. Dell's Dimension PCs are backed by a three-year warranty on parts and one year of free labor; toll-free support is available 24 hours a day. The company continues to earn top marks for service and system reliability in our reader fax-back surveys.

2 DELL DIMENSION M200A

PRO: Excellent support, a lot for the money

CON: Slow for an MMX-200, monitor a little dull

With a PC WorldBench score of 219, this MMX-200 minitower is only slightly faster than the average MMX-166 system. But at $2149, this lively home PC is $400 less than the average system in its CPU class, and it comes with an appealing set of components: a roomy 2.1GB hard drive, a 12X CD-ROM drive, a 33.6-kbps voice modem, and Microsoft Office Small Business Edition. Unfortunately, the 15-inch LS monitor that came with our test unit is not Dell's best; the picture lacks sharpness. It's worth the extra $175 to get Dell's basic 17-inch monitor.

Dell Dimension M200a

The M200a's clean interior makes it easy to upgrade. We also reviewed the Dimension M166a, an MMX-166 version of this system that sells for $1743 and includes the Microsoft Office Small Business Edition suite; it, too, is a good value.

Dell's documentation is complete with illustrations, index, and glossary. We just wish it were integrated into one book. ▶

TOP 20 BUDGET DESKTOPS — STANDARD FEATURES

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS M166s*	Pentium MMX-166	32	512	4.3	Matrox Millennium	4/WRAM	15/13.8	.28	12X
2	Dell Dimension M200a*	Pentium MMX-200	16	256	2.1	integrated	2/DRAM	15/13.6	.28	12X
3	Gateway 2000 G5-166 M*	Pentium MMX-166	16	256	1.3	integrated	2/EDO DRAM	17/16	.28	16X
4	IBM PC 350 (Pentium-166)*	Pentium-166	16	256	1.3	integrated Trio64V+	2/EDO DRAM	15/13.7	.28	6X
5	Dell OptiPlex Gs+166*	Pentium-166	32	256	2.1	integrated	2/VRAM	15/14	.28	8X
6	Quantex QP5/166 SM-3	Pentium MMX-166	32	512	2.5	STB Velocity 3D	4/SGRAM	17/16	.25	12X
7	HP Pavilion 5320	Pentium-150	16	256	1.6	integrated	2/EDO DRAM	15/13.8	.28	8X
8	Micro Express MicroFlex-K5/5166	AMD K5-PR166	32	512	2.1	ATI PC2TV	2/WRAM	15/13.8	.28	10X
9	Midwest Micro MWH-200	Pentium-200	16	512	3.2	STB Lightspeed 128	2/MDRAM	15/13.8	.28	16X
10	Micro Express MicroFlex-PCI/5166	Pentium-166	32	512	2.1	STB Lightspeed 128	2/MDRAM	17/16	.28	12X
11	Quantex QP6/200 PD-4	Pentium Pro-200	32	256	3.2	Matrox Millennium	2/WRAM	17/16	.28	12X
12	HP Vectra VE 5/133	Pentium-133	16	256	1.1	integrated SiS 6205	2/EDO DRAM	15/14	.28	8X
13	CyberMax Cyrix Max C3 P166+	Cx6x86-PR166+	24	512	2.1	STB Lightspeed 128	4/MDRAM	15/13.8	.28	12X
14	Polywell Poly 500QX	AMD K5-PR166	32	512	2.5	Diamond Stealth 30 2000	2/EDO DRAM	15/13.8	.28	12X
15	Kingdom 6x86 P166+ Super Value	Cx6x86-PR166+	16	256	2.1	PCI-60V	2/EDO DRAM	15/13.8	.28	16X
16	Quantex QP5/200 M-4	Pentium MMX-200	32	512	3.2	Matrox Mystique	4/SDRAM	17/16.1	.28	12X
17	Kingdom Pentium MMX 200 Home & Office	Pentium MMX-200	32	512	3.2	Hercules Dynamite 128	4/MDRAM	17/15.8	.28	16X
18	ProGen Atlas X 200	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/WRAM	17/15.8	.26	16X
19	CyberMax Max 16/P200MMX	Pentium MMX-200	32	512	4.3	Diamond Stealth 30	4/EDO DRAM	17/15.7	.26	12X
20	DirectWave P133 MVP Pro	Pentium-133	16	512	2.5	Diamond Stealth 3D 2000	4/EDO DRAM	17/16.1	.28	16X

* Best Buy [1] Download only, uploads at 33.6 kbps; uses 3Com U.S. Robotics' x2 technology. [2] Toll call.

3 GATEWAY 2000 G5-166 M

PRO: Good price, excellent internal design

CON: None significant

Maybe you aren't the type of computer user that absolutely *has* to have the newest, fastest processor; maybe a good price/performance ratio is what gets your attention. If so, the Gateway 2000 G5-166 M is your kind of PC. The newest addition to Gateway's successful G5 line has a Pentium MMX-166 processor, and it's completely outfitted for multimedia and communications.

What makes this unit a shoo-in for a Best Buy is the price—a mere $1779. That's more than $350 less than the average cost of all MMX-166 systems we've looked at. The G5-166 M's WorldBench score of 213 is average for its CPU class.

The unit comes with Gateway's CrystalScan 17-inch monitor. The display isn't as full featured or as well focused as Gateway's Vivitron (which costs $100 more), but it's adequate for word processing and spreadsheets. The system also houses a smallish 1.3GB hard drive, 2MB of integrated video, a 16-bit sound card, a 16X CD-ROM drive, a Telepath 56-kbps modem, and Altec Lansing speakers.

From the outside, the case is quite a looker. Its softened edges give it a less utilitarian look than the usual rectangular cookie-cutter boxes. It's sturdy and, with thumbscrews, very easy to open. Although the front panel's on/off switch and reset buttons are unlabeled, the input-output ports in back are color-coded.

Gateway 2000 G5-166 M

If you need to add a component that Gateway didn't ship with the G5-166 M, or upgrade, swapping ISA or PCI cards shouldn't be a problem, as the interior of the system is one of the cleanest we've seen. Everything is well organized for easy access. The cables are neatly bundled, so you won't have to push them aside to add memory, and nothing obstructs the adapter slots. All of the drive bay screws and rails are placed so that you can get at them without contortion, although the installed hard drive does take up the most accessible bay.

One of Gateway 2000's strengths has always been its documentation. The man-

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
33.6	Sound Blaster 16	minitower	64	512	1	3/1	4	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	Sound Blaster 16	minitower	64	512	1	3/1	6	3/1	24	Sat., Sun.	BBS, CIS, WWW
56 [1]	integrated	minitower	128	512	1	3/2	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
–	–	desktop	192	512	4	1/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
–	Sound Blaster 16	compact	128	256	2	0/0	2	3/1	24	Sat., Sun.	BBS, CIS, WWW
33.6	Ensoniq Audio PCI S5016	minitower	128	512	2	2/1	4	3/1	24	Sat., Sun.	BBS, WWW
33.6	integrated	desktop	128	256	2	1/0	3	1/1	24 [2]	Sat., Sun.	AOL, BBS, CIS, WWW
33.6	Superior Sound32	minitower	128	512	4	3/2	3	4/4	24	Sat., Sun.	WWW
33.6	Sound Blaster AWE 64	minitower	128	512	4	3/2	3	3/3	12	Sat.	BBS, WWW
33.6	Sound Blaster AWE 32	minitower	256	512	4	3/1	4	4/4	24	Sat., Sun.	WWW
33.6	Ensoniq Soundscape Vivo 90	minitower	256	512	2	3/3	4	3/1	24	Sat., Sun.	BBS, WWW
–	Sound Blaster 16 PnP	desktop	192	256	4	1/1	3	3/3	11 [2]	–	AOL, BBS, CIS, WWW
33.6	Ensoniq Soundscape Vivo 90	minitower	128	512	0	3/2	4	3/1	12	Sat.	BBS, WWW
33.6	Supersound Origins 3D	minitower	128	512	4	3/0	4	3/5	24	Sat., Sun.	BBS, WWW
–	Schubert 3D	tower	128	512	3	3/3	5	3/1	13	Sat.	WWW
33.6	Ensoniq Soundscape Vivo	minitower	128	512	2	2/1	4	3/1	24	Sat., Sun.	BBS, WWW
33.6	Schubert 3D	minitower	128	512	3	3/3	4	3/1	13	Sat.	WWW
33.6	ProGen AWE 32 PnP 3D	minitower	256	512	4	3/1	4	3/1	9	–	BBS, WWW
33.6	Ensoniq Soundscape Vivo	minitower	128	512	2	2/2	3	3/1	24	Sat., Sun.	BBS, WWW
33.6	Sound Blaster AWE 32	minitower	256	512	2	3/0	3	3/1	24	Sat., Sun.	BBS, WWW

ual we received with the G5-166 M is a helpful and friendly tour guide that keeps you focused and moves you along to the information you need. The company also integrates its material very well with the vendor-supplied component manuals.

The software package bundled with the system is another strong point. Gateway covers both business and home-oriented applications. Encarta Encyclopedia 97, Microsoft's Office 97 Small Business Edition, and Street Plus, which helps you locate virtually any address in the United States, are all included. Gateway also throws in a few titles, like The Human Body 2.0, that take advantage of MMX.

Our readers rate Gateway's system reliability as only fair, but hail its support as among the best.

4 IBM PC 350 (PENTIUM-166)

PRO: LAN tools, USB ports, infrared option

CON: Subpar monitor

When we first reviewed the P-166 PC 350 in December, we noted it was pricey. Now the cost is down almost $800 to an affordable $1715. If you're looking for a networkable system and will be satisfied with average performance, you'll be pleased with the PC 350. Just keep in mind that standard (non-MMX) Pentiums are no longer the top choice for graphics or multimedia. The latter consideration shouldn't bother buyers of this system, however, as this PC is a buttoned-down corporate model with no sound or speakers.

IBM PC 350

The unit comes with special tools that allow a network administrator to monitor and work on the system from a central location. NetFinity can update software and track PC configurations across a network, while Wake-on-LAN lets administrators perform upgrades and take inventory when no one is in the office.

The PC 350 also has built-in infrared support with a special port for connecting a receiver/transmitter. The infrared kit costs $79 extra.

IBM backs its PCs with a three-year parts, one-year labor warranty. Toll-free support is available around the clock. In our surveys, readers give IBM good marks for the quality of its support. ▶

5 DELL OPTIPLEX GS+166

PRO: Built-in networking, great support

CON: Thin feature set, limited expandability

This slim, compact $2018 desktop is the entry-level system in Dell's network-ready corporate PC line. The OptiPlex Gs+166 is a good choice for the business buyer looking for a low-cost machine that offers a space-saving design and built-in ethernet connectivity.

This Pentium-166's PC WorldBench score of 198 is a little low these days, and most of its components are basic. But because it has a non-MMX CPU, its price is low for an OptiPlex. The 15-inch Dell monitor has as clear a display as you'll find in that size, and extras include a good pair of speakers and a 16-bit Sound Blaster card. The plain-vanilla Pentium does a competent job with most business apps, but it's far from the best choice now for multimedia or graphics. Dell also bundles the Microsoft Office Professional software package. There's plenty of room in the system's 2.1GB hard drive, but if you want to add a Zip drive or a tape back-up drive, you're out of luck, as there are no free bays. ▶

Dell OptiPlex Gs+166

TOP 20 BUDGET DESKTOPS

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Dimension XPS M166s*	Pentium MMX-166	32	512	223
2	Dell Dimension M200a*	Pentium MMX-200	16	256	219
3	Gateway 2000 G5-166 M*	Pentium MMX-166	16	256	213
4	IBM PC 350 (Pentium-166)*	Pentium-166	16	256	197
5	Dell OptiPlex Gs+166*	Pentium-166	32	256	198
6	Ouantex OP5/166 SM-3	Pentium MMX-166	32	512	218
7	HP Pavilion 5320	Pentium-150	16	256	180
8	Micro Express MicroFlex-K5/5166	AMD K5-PR166	32	512	208
9	Midwest Micro MWH-200	Pentium-200	16	512	210
10	Micro Express MicroFlex-PCI/5166	Pentium-166	32	512	212
11	Ouantex OP6/200 PD-4	Pentium Pro-200	32	256	235
12	HP Vectra VE 5/133	Pentium-133	16	256	166
13	CyberMax Cyrix Max C3 P166+	Cx6x86-PR166+	24	512	205
14	Polywell Poly 5000X	AMD K5-PR166	32	512	213
15	Kingdom 6x86 P166+ Super Value	Cx6x86-PR166+	16	256	197
16	Ouantex OP5/200 M-4	Pentium MMX-200	32	512	221
17	Kingdom Pentium MMX 200 Home & Office	Pentium MMX-200	32	512	233
18	ProGen Atlas X 200	Pentium MMX-200	32	512	232
19	CyberMax Max I6/P200MMX	Pentium MMX-200	32	512	230
20	DirectWave P133 MVP Pro	Pentium-133	16	512	194

PERFORMANCE

*Best Buy

Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows · Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC World8ench, PC World's application-based benchmark. A higher PC World8ench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC World8ench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing).

The most advanced technology is used to outperform the HP ScanJet 4c:

- Faster scanning speed; full-color page in 74 seconds
- Bit Enhancement Technology (B.E.T.) that allows the scanner to capture more accurate colors and tones and provide smoother gradations
- Scans up to legal size
- Enclosed optical system for dust-free scanning; cold cathode lamp lasts ten times longer than a fluorescent lamp
- Bundled with Adobe® PhotoDeluxe™ or Adobe Photoshop® 4.0 image editing software and Presto!® PageManager® with OCR
- Advanced technology at an affordable price

PRODUCTIVITY. CREATIVITY. THE ASTRA 1200S SCANNER GIVES YOU BOTH.

The Astra 1200S does more than you ever thought a scanner could. It's the next generation of the award-winning S-12, and it uses Bit Enhancement Technology to provide crisp, clean images with amazing detail. The Astra 1200S not only helps you produce quality scans, but also send faxes and e-mail, OCR, make copies with UMAX Copy Utility, add text and images to your work, and create Web pages. There's no limit to how productive you can be with the Astra 1200S from UMAX.

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Circle 250 on reader service card

Dell continues to get the highest ranking for reliability and support in our fax-back surveys. Policies include a warranty of three years on parts and one year on labor, and round-the-clock tech support.

New This Month

The following PCs made our Budget Desktops chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

6 QUANTEX QP5/166 SM-3

PRO: Powerful package for under $2000

CON: Mediocre reliability score

Quantex's QP5/166 SM-3 adds a healthy dollop of MMX performance to the company's line of budget PCs, and it almost earned a Best Buy. Powered by an Intel Pentium MMX-166, it's fast and loaded with features—yet it's still priced at a quite reasonable $1899. For the dough, you get a nice minitower with 2.5GB of storage, a quick 12X CD-ROM drive, a fast 33.6-kbps voice modem, a microphone, sound, and speakers. The 17-inch MAG InnoVision monitor will satisfy most business users. To soup this system up, Quantex threw in 32MB of RAM, resulting in a PC WorldBench score of 218—very fast for its class.

Quantex QP5/166 SM-3

Overall, the design of the QP5/166 SM-3 is good. The case is sturdy, but harder to open than we'd like. The on/off switch isn't clearly labeled, but the I/O ports are color-coded to avoid confusion.

Inside the case, there's plenty of room. Our system had three open drive bays and four available expansion slots, all of which were easily accessible.

Quantex offers toll-free tech support 24 hours a day and a three-year parts warranty. In our ongoing survey, the company's reliability rating is improving, but it's still not among the best.

To Quantex's credit, the documentation that we received with our QP5/166 SM-3 was better than most. It was clearly written and included easy-to-understand setup instructions.

8 MICRO EXPRESS MICROFLEX-K5/5166

PRO: Quick, good features for the price

CON: Documentation could be better

If you need good performance, full multimedia, and a modem—and you have only a few bucks to spend—this could be your PC. It's an example of how AMD's fast, inexpensive K5 and K6 CPUs are providing much-needed competition for Intel's processors. This PC is priced over $450 less than its Pentium MMX counterparts, and with a PC WorldBench score of 208, it's 7 percent faster than the average P-166 and only about 7 percent slower than the number one Dell Dimension XPS M166s.

Micro Express MicroFlex

The $1349 MicroFlex-K5/5166 isn't as fast as some of the other K5-PR166–based machines we've tested, but it's still quick enough to outpace some Pentium-200s. This minitower is also nicely designed, with a well-labeled on/off switch and an easily removed cover. The interior is one of the cleanest we've seen—no cable clutter to speak of.

Our system came well equipped, with 32MB of SDRAM and a 2.1GB hard drive. It also included a generic 33.6-kbps modem, a Superior Sound32 sound card and speakers, and a 15-inch Princeton monitor. All in all, a lot for the price.

You get separate booklets for Windows 95 and the peripherals, but no system-specific manual. If you already know how to set up a PC, they're sufficient; if you don't, they won't help much. Tech support is now available 24 hours a day, and Micro Express's warranty, at four years, is very attractive. However, we don't have enough data to compile a reliability and service profile for Micro Express. So this PC is best bought by those who have PC savvy or a good MIS department.

18 PROGEN ATLAS X 200

PRO: Good price, above-average performance

CON: Meager manuals, short tech support hours

If you're buying a new home PC and want to make sure it has the multimedia oomph for gaming *and* business, the Atlas X 200 from ProGen satisfies those requirements and saves you a few bucks—although the tech support hours are short. There's plenty of power in this MMX-200—it earned an impressive PC WorldBench score of 232—giving it the speed of a power machine for only $1999.

The components used in this expandable system are impressive, including a Matrox Millennium video card with a healthy 4MB of WRAM, a fast 16X CD-ROM drive, a good ProGen AWE32 PnP 3D sound card with wavetable capabilities, and sweet-sounding speakers with a subwoofer. ProGen also throws in a 3Com USR 33.6 Faxmodem and a 17-inch MAG InnoVision monitor.

ProGen's documentation is disappointing, however. You get the standard vendor-supplied booklets for the peripherals, but nothing in the way of high-quality, thorough system information: The slim manual begins with clear, concise instructions and helpful illustrations covering the setup, but it then lapses into the brand of techspeak recognizable only to those who have been working on their particular systems for a number of years.

ProGen Atlas X 200

Support policies also could use fleshing out. The warranty of three years for parts and one year for labor is good, but toll-free technical support is available for only nine hours each weekday. ▶

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Budget Desktops chart. For write-ups, see PC World Online (www.pcworld.com/t20pcsnaps).

- ALR Optima SL 5166 X
- AST Bravo MS 5166
- DTK Quin-55M/PM 200
- Intergraph TD-25
- Kingdom IBM P200+ Value
- LEK Tornado 150
- Micro Express MicroFlex-686/P200+LC
- Nova NV 686 200T
- Premio Apollo TX-200-MMX
- Sys Technology Sys Performance 200K6

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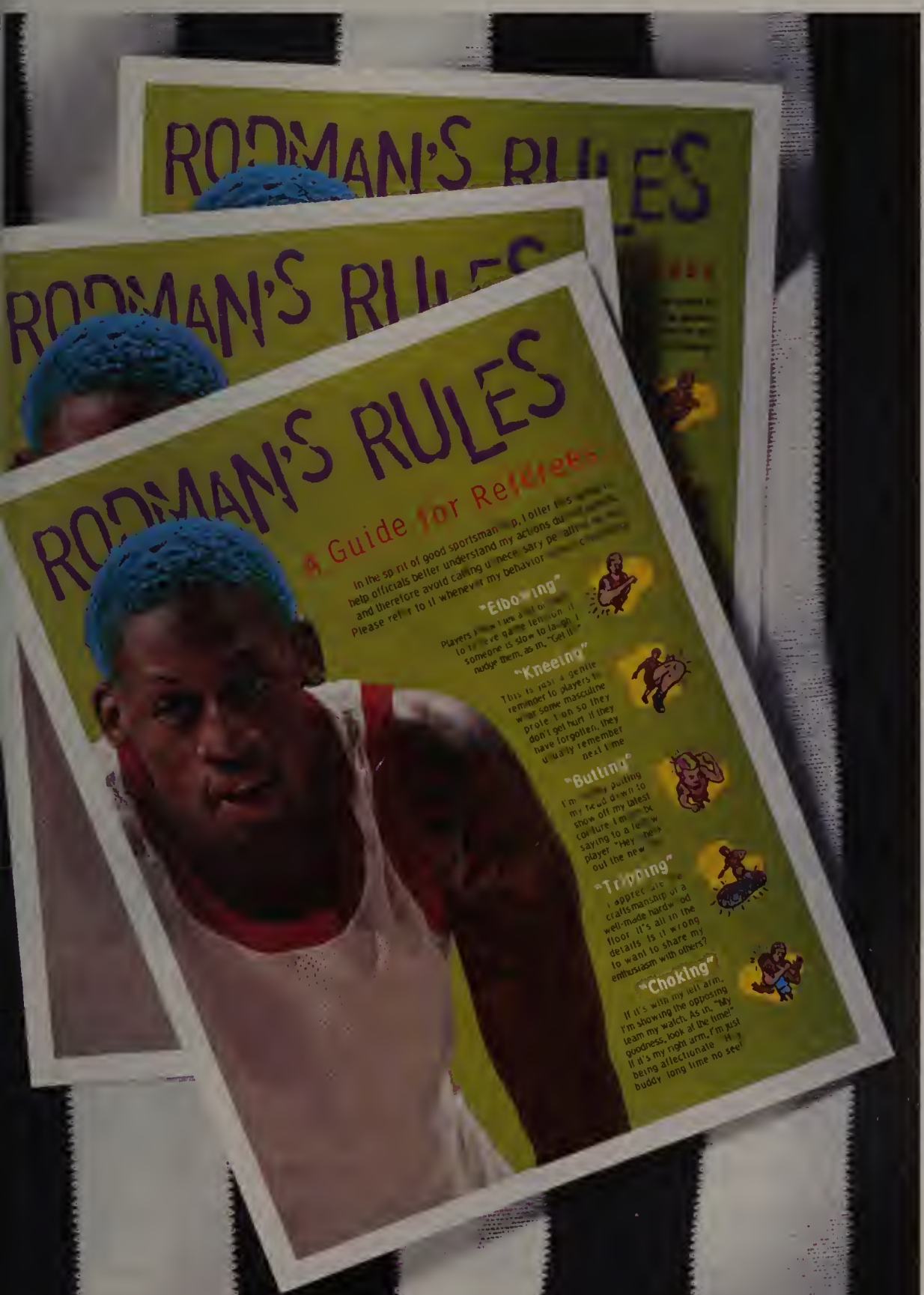

COLOR PAGEWORKS

No matter what kind of image you have, chances are a little improvement couldn't hurt. To that end, Minolta introduces PageWorks™, a revolutionary line of laser printers for business.

Consider Minolta's Color PageWorks. It's one of the most affordable true 600 dots per inch color laser printers available. Finally, you can afford to add the impact of real laser color to the documents you print every day.

PAGEWORKS 6L

PAGEWORKS 6e

PAGEWORKS 12

PAGEWORKS 20

COLOR PAGEWORKS

In addition, there is also a full line of Minolta monochrome laser printers. Featuring speeds from 6 to 20 pages per minute, each is designed for maximum output quality and throughput speed, yet priced for a minimal budget.

For over 10 years, Minolta has been one of the world's largest manufacturers of laser printer engines. That field-proven reliability allows us to offer laser printers of unparalleled quality and value.

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Circle 153 on reader service card

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PC WORLD

TOP 20 NOTEBOOK PCs

	POWER NOTEBOOKS	Last month	Month tested	Street price (5/9/97)	CPU	Comments
1	Dell Latitude LM M166ST 800/388-8542 www.dell.com	1	June 97	$3899	Pentium MMX-166	$100 off one of fastest notebooks on chart, long battery life, large hard drive.
2	WinBook LM 800/468-2162 www.winbookcorp.com/	3	May 97	$3199	Pentium-133	Fast, long battery life; keyboard could be better.
3	Transmonde Vibrant 133T 888/988-2883 www.transmonde.com	4	June 97	$2999	Pentium-133	Speedy, terrific battery life, interesting design; support policies limited.
4	WinBook FX 800/468-2162 www.winbookcorp.com/	5	May 97	$3599	Pentium-133	Sturdy notebook with comfortable keyboard and large hard drive.
5	Gateway 2000 Solo 2100 S5-150 800/846-2000 www.gw2K.com	6	Apr 97	$3749	Pentium MMX-150	Quick, loaded MMX with good battery and outstanding features.
6	Gateway 2000 Solo 2200 S5-166 800/846-2000 www.gw2K.com	–	May 97	$4439	Pentium MMX-166	Uncompromising desktop replacement is still the fastest we've tested.
7	Dell Latitude XPi CD M166ST 800/388-8542 www.dell.com	8	July 97	$4838	Pentium MMX-166	Quick; expensive; great keyboard; heavy.
8	Compaq Presario 1080 800/345-1518 www.compaq.com	9	June 97	$4499	Pentium MMX-166	Audiophiles will like sleek unit; heavy, expensive, 90 days on-site service.
9	Digital HiNote VP 575 800/344-4825 www.windows.digital.com	–	July 97	$4499	Pentium MMX-166	Fast, good-looking, well-built slimline with super battery; no modem.
10	Toshiba Tecra 740CDT 800/334-3445 www.computers.toshiba.com	–	NEW	$5899	Pentium MMX-166	Fast, first 13.3-inch screen to make our chart; very expensive heavyweight.
	BUDGET NOTEBOOKS					
1	Compaq Armada 1130T 800/345-1518 www.compaq.com	1	Apr 97	$1399	Pentium-120	Low-cost active-matrix will be replaced by next month.
2	Compaq Armada 1520DM 800/345-1518 www.compaq.com	–	NEW	$2199	Pentium-133	Trim, dual-scan screen; great first notebook for the budget-conscious.
3	Toshiba Satellite Pro 430CDS 800/457-7777 www.computers.toshiba.com	6	July 97	$1699	Pentium-120	$300 price drop, excellent keyboard, fast CD-ROM drive, heavy.
4	CTX EZBook 750MS 800/888-9052 www.ctxintl.com	–	NEW	$2149	Pentium MMX-150	Big screen, fastest budget notebook; short support hours.
5	WinBook XP5 Pro P150 800/468-2162 www.winbookcorp.com/	3	June 97	$2599	Pentium-150	Very quick, comes with vivid screen, modem, CD-ROM drive.
6	Toshiba Satellite 200CDS 800/457-7777 www.computers.toshiba.com	10	July 97	$1299	Pentium-100	$300 price drop on slow, entry-level corporate portable.
7	Mega Image MegaBook 911 800/250-1876 www.megai.com	–	Mar 97	$2199	Pentium-133	$300 off quick Pentium-133 with relatively slow CD-ROM drive.
8	Gateway 2000 Solo 2100 S5-120 800/846-2000 www.gw2K.com	7	Jan 97	$2099	Pentium-120	Very fast for a Pentium-120, fast CD-ROM drive, relatively short battery life.
9	ARM TS753CD-113D 408/935-9800 www.armcomputer.com	–	July 97	$1699	Pentium-133	Inexpensive, undistinguished basic note with 24-hour support.
10	AcerNote Light 382 800/733-2237 www.acer.com/aac/	8	July 97	$1999	Pentium-150	Fast, best battery life on the Top 20; case feels a bit flimsy.

Best Buy See features chart, page 232; performance chart, page 234.

[1] Includes computer, adapter, power card, floppy drive, and CD-ROM drive if notebook has one. [2] Insufficient data.

THIS MONTH WE SAY FAREWELL to discontinued Dell and Hewlett-Packard portables (the Dell Latitude XPi P133ST, long a power Best Buy, and HP's OmniBook 800CT and OmniBook 5500CS)—and hello to seven chart newcomers, including three tested this month. Toshiba's Tecra 740CDT, in tenth place on the power chart, is the first notebook with a 13.3-inch screen to make our list. Our favorite of 11 that missed: the $5175 HP OmniBook 5700CTX, an MMX-166 portable with a 3GB hard drive. To read about the notebooks that didn't make our Top 20, visit PC World Online (www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	PC WorldBench score/ rating	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/ rating	Traveling weight [1]	Reader service number
85	212/outstanding	average	average	very good	average/fair	5:52/very good	heavy	694
83	182/good	inexpensive	average	very good	average/fair	5:46/very good	heavy	695
83	190/very good	inexpensive	average	outstanding	below average/poor	6:19/outstanding	heavy	696
83	188/good	average	average	very good	average/fair	4:15/good	heavy	697
82	199/very good	average	average	outstanding	below average/fair	3:12/good	heavy	698
82	218/outstanding	expensive	average	very good	below average/fair	3:46/good	average	699
82	199/very good	expensive	average	outstanding	average/good	4:35/good	heavy	700
81	197/very good	expensive	average	good	above average/fair	5:02/very good	heavy	701
81	209/very good	expensive	[2]	good	[2]/poor	6:34/outstanding	average	702
80	190/very good	very expensive	[2]	outstanding	[2]/fair	4:28/good	very heavy	703
Power scorecard weightings ▶	Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	
83	140/good	very inexpensive	average	good	above average/fair	3:57/good	average	704
80	151/good	average	average	good	above average/fair	3:39/good	average	705
79	141/good	inexpensive	average	good	below average/fair	4:10/good	heavy	706
79	198/outstanding	average	[2]	satisfactory	[2]/poor	4:21/good	heavy	707
79	183/outstanding	expensive	average	very good	average/fair	3:24/good	average	708
79	91/satisfactory	very inexpensive	average	satisfactory	below average/fair	3:51/good	heavy	709
78	165/very good	average	[2]	good	[2]/fair	4:38/good	heavy	710
77	171/very good	average	average	good	below average/fair	2:15/satisfactory	average	711
77	131/satisfactory	inexpensive	[2]	satisfactory	[2]/good	2:55/good	heavy	712
77	170/very good	average	below average	good	[2]/fair	6:45/outstanding	average	713
Budget scorecard weightings ▶	Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	All products: 909

POWER NOTEBOOKS

This Month's Best Buys

1 DELL LATITUDE LM M166ST

PRO: Blazing speed, big bright screen

CON: Heavy, no modem

The Latitude LM M166ST is aimed at business users looking for a notebook that has a lot of the performance and features they find in their desktops. Packing a Pentium MMX-166 CPU and a whopping 40MB of RAM, this fleet-footed portable earned a PC WorldBench score of 212—faster than some desktop MMX-166 systems. The price is a reasonable $3899—$100 less than last month. There's also a big software bundle: Microsoft Office Small Business Edition; the LapLink file transfer and remote control utility; and Sidekick 95, a personal information manager.

Dell Latitude LM M166ST

Seasoned travelers may balk at the Latitude's hefty 9.2 pounds (with AC ▶

TOP 20 NOTEBOOK PCs — STANDARD FEATURES

	POWER NOTEBOOKS	CPU	Traveling weight (pounds)[1]	RAM (MB)	Hard drive (MB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Dell Latitude LM M166ST*	Pentium MMX-166	9.2	40	2160	active	12.1	800 x 600	65,536	lithium ion	touchpad
2	WinBook LM*	Pentium-133	8.6	16	1083	active	12.1	800 x 600	65,536	lithium ion	touchpad
3	Transmonde Vibrant 133T	Pentium-133	10.4	32	1440	active	12.1	800 x 600	65,536	NiMH	touchpad
4	WinBook FX	Pentium-133	9.4	32	2167	active	12.1	800 x 600	65,536	lithium ion	eraserhead
5	Gateway 2000 Solo 2100 S5-150	Pentium MMX-150	8.8	40	1300	active	12.1	800 x 600	65,536	lithium ion	touchpad
6	Gateway 2000 Solo 2200 S5-166	Pentium MMX-166	8.2	40	2160	active	12.1	800 x 600	65,536	lithium ion	touchpad
7	Dell Latitude XPi CD M166ST	Pentium MMX-166	9	32	2160	active	12.1	800 x 600	65,536	lithium ion	trackball
8	Compaq Presario 1080	Pentium MMX-166	8.8	16	1440	active	12.1	800 x 600	65,536	lithium ion	touchpad
9	Digital HiNote VP 575	Pentium MMX-166	8.2	16	2160	active	12.1	800 x 600	65,536	lithium ion	touchpad
10	Toshiba Tecra 740CDT	Pentium MMX-166	11.2	16	2100	active	13.3	1024 x 768	65,536	lithium ion	eraserhead
	BUDGET NOTEBOOKS										
1	Compaq Armada 1130T*	Pentium-120	7.5	16	1080	active	10.4	800 x 600	256	NiMH	trackball
2	Compaq Armada 1520DM*	Pentium-133	7.8	16	1083	dual-scan	11.3	800 x 600	65,536	lithium ion	touchpad
3	Toshiba Satellite Pro 430CDS	Pentium-120	8.8	16	1358	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
4	CTX EZBook 750MS	Pentium MMX-150	8.6	16	1080	dual-scan	12.1	800 x 600	65,536	NiMH	touchpad
5	WinBook XP5 Pro P150	Pentium-150	8.4	16	1083	active	11.3	800 x 600	256	lithium ion	eraserhead
6	Toshiba Satellite 200CDS	Pentium-100	9.2	8	810	dual-scan	11.3	800 x 600	65,536	NiMH	eraserhead
7	Mega Image MegaBook 911	Pentium-133	9.2	16	1374	active	12.1	800 x 600	65,536	NiMH	touchpad
8	Gateway 2000 Solo 2100 S5-120	Pentium-120	8.2	16	1080	dual-scan	11.3	800 x 600	65,536	NiMH	touchpad
9	ARM TS753CD-113D	Pentium-133	8.8	16	1083	dual-scan	11.3	800 x 600	256	NiMH	touchpad
10	AcerNote Light 382	Pentium-150	8.4	16	1400	dual-scan	11.3	800 x 600	256	NiMH	touchpad

*Best Buy ● Yes ○ No [1] Includes computer, adapter, power cord, floppy drive, and CD-ROM drive if notebook has one.

adapter and removable 10X CD-ROM drive). But battery life is good—the lithium ion pack lasted nearly 6 hours in our tests. The keyboard is comfortable and quiet, and moving the pointer on screen with the touchpad is hassle-free. The 12.1-inch active-matrix screen gives sharp text and brilliant graphics. Built-in stereo speakers provide adequate sound.

Dell's documentation is superb, but its support policies, unlike those for its desktops, are only fair: Although the company offers nonstop phone support, it covers its Latitude LM systems for only one year. Readers responding to our monthly fax-back survey give Dell average marks for service and notebook reliability.

2 WINBOOK LM

PRO: Fast, long battery life, relatively low price

CON: Limited support policies, keyboard could be more ergonomic; heavy

The $3199 WinBook LM combines good speed with a well-rounded array of features that should suit the needs of most people who need to do some work on the road.

The LM includes a 1.1GB hard disk, a 6X CD-ROM drive, a high-quality 12.1-inch active-matrix screen, and a 28.8-kbps modem. Unfortunately, the keyboard isn't as easy to use as those on other WinBook models: Its keys aren't scalloped deeply enough for comfortable typing. Without the CD-ROM drive, the LM weighs 7.4 pounds, and it has a battery life of 5.75 hours—long enough for a cross-country flight. With the CD-ROM and AC adapter, the unit weighs 8.6 pounds.

WinBook LM

The WinBook LM's biggest problem isn't with the notebook itself but with the company's fairly thin support policies: a one-year warranty, a shortish 13 hours per day of technical support, and no Sunday support. However, responses to our fax-back survey have recently indicated improved reliability.

		EXPANDABILITY					CUSTOMER SUPPORT			
CD-ROM drive speed	Modem speed (kbps)	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
10X	–	72	1	●	○	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
6X	28.8	40	1	●	●	●	1/1	13	Sat.	BBS, WWW
6X	33.6	64	1	○	○	●	1/1	11	–	WWW
8X	33.6	40	1	●	●	●	1/1	13	Sat.	BBS, WWW
11X	33.6	72	1	●	●	●	1/1	24	Sat., Sun.	BBS, WWW
11X	33.6	80	1	●	●	●	1/1	24	Sat., Sun.	BBS, WWW
10X	33.6	80	0	○	○	●	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
10X	33.6	48	0	○	○	○	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
12X	–	80	1	●	○	●	1/1	12	–	AOL, BBS, CIS, WWW
11X	28.8	144	1	○	●	●	3/1	24	Sat., Sun.	WWW
–	–	48	0	○	○	○	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
10X	33.6	64	1	●	○	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
10X	–	48	1	○	●	●	1/1	24	Sat., Sun.	BBS, CIS, WWW
6X	–	72	2	●	●	●	1/1	10	–	WWW
8X	28.8	40	1	●	●	●	1/1	13	Sat.	BBS, WWW
6X	–	40	1	○	●	●	1/1	24	Sat., Sun.	BBS, CIS, WWW
6X	–	72	0	○	●	●	1/1	11	Sat.	BBS, WWW
11X	–	72	1	●	●	●	1/1	24	Sat., Sun.	BBS, WWW
8X	–	40	0	○	●	●	1/1	24	Sat., Sun.	AOL, BBS, WWW
10X	–	64	0	○	○	○	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW

New This Month

The following PC made our Power Notebooks chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

10 TOSHIBA TECRA 740CDT

PRO: Brilliant 13.3-inch screen, great documentation, comes with video camera

CON: Heavy, very expensive; screen panel flex

The Toshiba Tecra 740CDT offers high-end technology for the mobile professional—at a high-end price. It has a sharp, clear 13.3-inch screen with 1024 by 768 resolution, an Intel Pentium MMX-166 processor, and a 2.1GB hard drive. But it's not for the fiscally faint of heart—it costs a hefty $5899. One reason for the high price is the video capture board, camera, and internal 28.8-kbps modem that accompany the system. Indeed, Toshiba is marketing this notebook as a portable videoconferencing system. The 740CDT is speedy by power notebook standards, although its PC WorldBench score of 190 means that our number one MMX-166 notebook, Dell's Latitude LM M166ST, is almost 12 percent faster.

Toshiba Tecra 740CDT

While the 740CDT has a beautiful display, we were less impressed by the overall design and construction. We found some flex in the screen panel (which means it may not hold up well under the roughest handling), and the CD-ROM/floppy drive bay is placed front and center—a position that makes media changes difficult when working with the unit on your lap (although you can attach the floppy drive externally). Another flaw is a volume control that allows a sound level too high for the internal speakers to handle without distortion—a troubling oversight.

On the plus side, the Tecra's keyboard and eraserhead pointing device are quite comfortable. This eraserhead takes ▶

less effort to operate than most and is more accurate and easier to use one-handed than the currently popular touchpads.

But ergonomics aside, the Tecra is no flyweight—with the video camera and other options, it weighs in at a ponderous 11.2 pounds. Leave off the extras, and it's still 9.2 pounds. However, many power notebook buyers will accept the added weight as a fair trade-off for features like the video capabilities and the big screen.

The Tecra's user guide has to be the world's thickest. Accordingly, it's extremely thorough—and also very well written. In addition, Toshiba's toll-free technical support is available around the clock, every day. Unfortunately, after your three-year warranty runs out you'll have to pay $35 per incident for answers to technical questions you can't resolve on your own.

BUDGET NOTEBOOKS

This Month's Best Buys

1 COMPAQ ARMADA 1130T

PRO: Crisp display, low cost, very sturdy, fast

CON: No multimedia features or modem

If you want a rugged portable with good performance and an active-matrix screen at a surprisingly ▶

TOP 20 NOTEBOOK PCs

PERFORMANCE

	POWER NOTEBOOKS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Latitude LM M166ST*	Pentium MMX-166	40	256	212
2	WinBook LM*	Pentium-133	16	256	182
3	Transmonde Vibrant 133T	Pentium-133	32	256	190
4	WinBook FX	Pentium-133	32	256	188
5	Gateway 2000 Solo 2100 S5-150	Pentium MMX-150	40	256	199
6	Gateway 2000 Solo 2200 S5-166	Pentium MMX-166	40	256	218
7	Dell Latitude XPi CD M166ST	Pentium MMX-166	32	256	199
8	Compaq Presario 1080	Pentium MMX-166	16	256	197
9	Digital HiNote VP 575	Pentium MMX-166	16	256	209
10	Toshiba Tecra 740CDT	Pentium MMX-166	16	256	190
	BUDGET NOTEBOOKS				
1	Compaq Armada 1130T*	Pentium-120	16	0	140
2	Compaq Armada 1520DM*	Pentium-133	16	256	151
3	Toshiba Satellite Pro 430CDS	Pentium-120	16	0	141
4	CTX EZBook 750MS	Pentium MMX-150	16	256	198
5	WinBook XP5 Pro P150	Pentium-150	16	256	183
6	Toshiba Satellite 200CDS	Pentium-100	8	0	91
7	Mega Image MegaBook 911	Pentium-133	16	256	165
8	Gateway 2000 Solo 2100 S5-120	Pentium-120	16	256	171
9	ARM TS753CD-113D	Pentium-133	16	256	131
10	AcerNote Light 382	Pentium-150	16	256	170

*Best Buy

Application test times in minutes 0 10 20 30 40 50 60

Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows · Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing).

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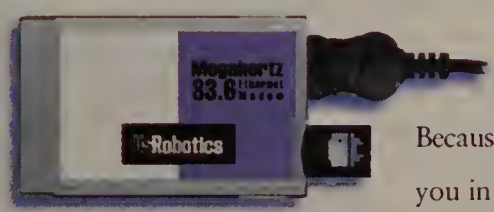

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Circle 238 on reader service card

low cost, the $1399 Armada 1130T fits the bill. If you want to take advantage of the price, however, you'd better act quickly—Compaq tells us that this model will be gone from stores by the end of August.

Compaq Armada 1130T

The 1130T is a no-frills machine—it has no multimedia, no modem, and no infrared port, and its 1GB hard drive is a little cramped by today's standards. Even so, you get a lot of notebook for the money. This Armada cranked out a PC WorldBench score of 140, which is very good for a Pentium-120 with 16MB of RAM. It's also the least expensive notebook we've seen with a color active-matrix screen—and it has 800 by 600 resolution, although the screen is small at 10.4 inches. Compaq also bundles Microsoft Works 4.0—an integrated package that has all the basics.

The keys have crisp action, and are comfortably sized and well spaced. The Armada uses a precise, sensitive trackball input device rather than a touchpad.

With a 7.5-pound traveling weight, the 1130T is fairly light and quite compact. If you need to compute on the go, it has a longish battery life of nearly 4 hours. The Armada series comes with clear, well-written documentation. Though Compaq provides just a one-year warranty on this budget unit, readers give the company an above-average rating for support and an average rating for PC reliability in our ongoing fax-back survey.

2 COMPAQ ARMADA 1520DM

PRO: Great all-in-one design requires no external power adapter

CON: Middling Pentium-133 performance

The Compaq Armada 1520DM boasts the great design and solid construction of the Armada line, and as a new offering, it will remain on the market longer than the number one Armada 1130T. Its Pentium-133 CPU and 11.3-inch dual-scan display help to keep the cost down to $2199. Compaq still manages to include a 10X CD-ROM drive, a 33.6-kbps modem, a 1.1GB hard drive, and great 16-bit stereo sound. Its PC WorldBench score of 151 is acceptable if you're not doing heavy number-crunching or fancy presentations.

By far the best feature is the integrated, all-in-one design. The CD-ROM, floppy drive, and even the power supply are built into main unit. That means fewer loose items to forget or carry around. All you have to remember is the power cord, and not even that if you plan to work for less than 3.5 hours at a stretch. The Armada's lithium ion battery lasted 3 hours and 39 minutes in our tests. Even with all that's packed in it, the notebook travels at only 7.8 pounds.

Although choice of pointing device and keyboard tends to be personal and varies depending on the user, we found both the keyboard and touchpad easy to work with. The keyboard has a lively feel, and the touchpad is appropriately sensitive. The dual-scan display is typical—you get color, but next to an active matrix, it looks lifeless. As with all dual-scans, you can't view the screen from much of an angle before you lose the picture. Still, budget notes usually involve some trade-offs, and this system's dual-scan screen makes the low price possible.

Compaq Armada 1520DM

The volume control for the stereo sound consists of two buttons (up and down) instead of the usual dial or sliding tab; when you press either button, you get a nice, audible click that corresponds to the setting increment.

As with all our budget notes, the warranty is for only one year, but Compaq guarantees a two-day turnaround on factory repairs and also provides round-the-clock toll-free support. According to readers in our fax-back survey, the company scores above average in support and average in system reliability.

New This Month

The following PC made our Budget Notebooks chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

4 CTX EZBOOK 750MS

PRO: Impressive speed, nice speakers

CON: Dull screen, short support hours

The first Pentium MMX notebook on our budget chart, this CTX is one of the few systems in its performance category to emphasize price over features. At $2149, it costs $350 less than the next cheapest P-150 MMX notebook in our lab, the NEC Versa 2655CD PC-6. Its PC Worldbench score of 198 ties it for second fastest among the five MMX-150s we've seen.

CTX EZBook 750MS

Features and design are a mixed bag. On the downside, you must push the power switch especially hard and hold it down for too long before the notebook turns on. The display is among the dullest dual-scan screens we've seen, and the documentation is far too rudimentary.

But battery life was over 4.3 hours in our tests, and the software bundle includes ClarisWorks for Windows 95, Microsoft Plus, and LapLink for Windows 95. CTX throws in a game pad, and the built-in stereo speakers sound great. With the AC adapter plugged in, you can pull out the battery and have both the floppy and CD-ROM drives installed.

CTX has a fairly typical one-year parts and labor warranty, and toll-free tech support is available only 10 hours a day. We have too few faxes from readers to rank the company's reliability and service. ■

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Notebook PCs chart. For write-ups, see PC World Online (www.pcworld.com/t20pcsnaps).

- EPS Apex XL-200
- EPS Apex L-166
- Fujitsu LifeBook 555TX
- Gateway 2000 Solo 2100
- HP OmniBook 800CT
- HP OmniBook 5700CTX
- IBM ThinkPad 760XD
- NEC Versa 2655CD PC-6
- Tatung TNB 5500
- Toshiba Portégé 660CDT
- Total Peripherals Alcam XL-353

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Circle 232 on reader service card

Win a Gateway 2000 G5-166 M

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Gateway 2000 G5-166 M, a Pentium-166 PC in this month's Top 20. Send in a separate copy of the survey for each of your PCs.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE. Fax your completed survey to 415/357-4522. Do NOT fax a cover page. Or mail it to *PC World*, Box 8-SS, c/o 800-SCAN, 543 Howard St., San Francisco, CA 94105-3013. Surveys must be received by August 31.
PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact winners by telephone and fax. If *PC World* is unable to do so within 30 days of the drawing, a new winner will be selected. No purchase necessary. Void where prohibited by law.
HOW TO FILL OUT THE FORM: Print your name (block capital letters) and your fax number, and fill the circles for each digit of your daytime phone number. Then fill out the questionnaire. AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Apple ○ AST ○ Austin (IPC) ○ Compaq ○ Compudyne ○ Comtrade ○ CTX ○ CyberMax ○ Dell ○ Diamond ○ Digital (DEC) ○ DTK ○ EPS ○ Epson ○ Everex ○ Fujitsu ○ Future Tech ○ Gateway 2000 ○ Hewlett-Packard ○ HiO ○ Hitachi ○ Hyundai ○ IBM ○ Insight ○ Intelesys ○ Leading Edge ○ Micro Express ○ Micron ○ Midwest Micro ○ MIS ○ Nat'l Micro ○ NCR ○ NEC ○ Packard Bell ○ Panasonic ○ PerComp ○ Pionex ○ Polywell ○ Quantex ○ Robotech ○ Samsung ○ Sharp ○ Sony ○ Swan ○ Sys Tech. ○ Tangent ○ Texas Instruments ○ Toshiba ○ Twinhead ○ Unisys ○ USA Flex ○ Vektron ○ WinBook ○ Xi ○ Zenith (ZDS) ○ Zenon ○ Other

What size is this PC?
○ Desktop
○ Notebook/laptop

What is the CPU?
○ PowerPC ○ Pentium ○ Pentium Pro ○ Pentium MMX ○ Pentium II ○ Other _____ ○ 6x86 ○ 6x86MX ○ MediaGX ○ K5 ○ K6

Where did you buy this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week
○ 1-2 weeks
○ 3-4 weeks
○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

Where do you use this PC? ○ At home/home office ○ At work ○ Both

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)
○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec ○ 92 ○ 93 ○ 94 ○ 95 ○ 96 ○ 97

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ One ○ Two ○ Three ○ Four ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Answer for the most recent problem—*other than DOA*—not reported in a prior survey.

When did this problem occur? (Specify month and year.)
○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec ○ 92 ○ 93 ○ 94 ○ 95 ○ 96 ○ 97

How long after you purchased your PC did the problem occur?
○ Less than 1 month ○ 1-3 months ○ 4-6 months ○ 7-12 months ○ More than 12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Incorrectly installed software ○ Wrong configuration ○ Faulty peripheral ○ Device conflicts ○ OS problem ○ Other ○ Don't know

If a component failed, which one was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ On site ○ In store ○ System swap ○ Component swap ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ Less than 1 minute ○ 1-2 minutes ○ 3-5 minutes ○ 6-10 minutes ○ 11-20 minutes ○ More than 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 15 minutes-1 hour ○ 2-5 hours ○ 6-10 hours ○ 11-24 hours ○ 1½-2 days ○ 3-5 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1-2 days ○ 3-7 days ○ 8-14 days ○ 15-30 days ○ More than 1 month ○ Never resolved ○ Awaiting resolution

Was it resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

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Circle 170 on reader service card

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Circle 237 on reader service card

PC WORLD

TOP 10 PRINTERS

	MONOCHROME PERSONAL PRINTERS	Month tested	Street price (5/15/97)	Overall rating	Speed for plain text (ppm)	Speed for full-page graphics (ppm)	Comments	Reader service number
1	HP LaserJet 6Lse 800/752-0900 www.hp.com	NEW	$399	80	5	1.8	FEATURES: 6-ppm laser. Standard 1M8 of RAM, 600-by-600-dpi maximum resolution, 100 sheets input, 100 output. PRO/CON: Excellent print quality and paper handling; faster text speed than its predecessor, the LaserJet 5L Xtra. Still slowest on the monochrome chart, and software bundle is not very useful.	647
2	Brother HL-720 800/827-6843 www.brother.com	June 97	$350	80	5.5	2.6	FEATURES: 6-ppm laser. Standard 512K of RAM, 600-by-600-dpi maximum resolution, 200 sheets input, 100 output. PRO/CON: Low price; fast performance; good print quality; 200-sheet input tray among the best on the chart. Not as easy to use as the HP LaserJet 6Lse; output tray takes up a lot of space.	648
3	NEC SuperScript 860 800/632-4636 www.nec.com	June 97	$399	79	7	2.4	FEATURES: 8-ppm laser. Standard 1MB of RAM, 600-by-600-dpi maximum resolution, 200 sheets input, 50 output. PRO/CON: $50 price drop; blistering text speed; easy controls for creating booklets and more; two-year warranty. Gray-scale graphics are blotchy; pages collate in reverse order.	649
4	NEC SuperScript 660plus 800/632-4636 www.nec.com	June 97	$349	79	5.1	2.5	FEATURES: 6-ppm laser. Standard 256K of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. PRO/CON: Low-priced laser has good print quality and speed; includes parallel cable and two-year warranty. Paper trays are flimsy; two-piece toner cartridge is hard to install.	650
5	Panasonic KX-P6500 800/742-8086 www.panasonic.com	June 97	$349	78	5.6	2.3	FEATURES: 6-ppm laser. Standard 512K of RAM, 2400-by-600-dpi maximum resolution, 100 sheets input, 50 output. PRO/CON: Huge price drop from $449; text and gray-scale print quality are very good, thanks to the 2400-dpi resolution enhancement; tower design saves space. On-screen help lacks detail.	651
	COLOR PERSONAL PRINTERS							
1	Epson Stylus Color 600 800/463-7766 www.epson.com	June 97	$299	82	2	0.6	FEATURES: 6-ppm monochrome/4-ppm color ink jet. 1440-by-720-dpi maximum resolution, 100 sheets input, 30 output. Similar $229 Stylus Color 400 is just 720 dpi. PRO/CON: Near-photo quality without special inks; easy installation; two-year warranty. Mediocre text quality on plain paper.	–
2	HP DeskJet 694C 800/752-0900 www.hp.com	June 97	$299	80	2.2	0.3	FEATURES: 3-ppm monochrome/0.8-ppm color ink jet. 600-by-600-dpi maximum resolution, 100 sheets input, 50 output. The DeskJet 692C is identical. PRO/CON: Easy to use; prints well on plain paper; software includes home and small-office applications. Printing photos requires special ink and paper.	652
3	Canon BJC-4200 Photo 800/848-4123 www.ccsi.canon.com	June 97	$279	80	1.4	0.3	FEATURES: 5-ppm monochrome/1-ppm color ink jet. 720-by-360-dpi maximum resolution, 100 sheets input and output. $249 BJC-4200 lacks photo kit. PRO/CON: $20 cheaper this month; bountiful software; photo kit included. Slowest printer on chart; not as easy to use as the DeskJet 694C.	653
4	HP DeskJet 820Cse 800/752-0900 www.hp.com	June 97	$299	79	4	0.3	FEATURES: 5-ppm monochrome/1.5-ppm color ink jet. 600-by-600-dpi maximum resolution, 150 sheets input, 50 output. PRO/CON: Price dropped $100. Near-laser text quality and speed; easy to use; includes Microsoft Publisher 97 desktop publishing app. Color graphics look fine except for photos.	654
5	HP DeskJet 672C 800/752-0900 www.hp.com	NEW	$199	79	1.7	0.3	FEATURES: 2.5-ppm monochrome/0.75-ppm color ink jet. 600-by-600-dpi maximum resolution, 100 sheets input, 50 output. PRO/CON: Very low price; prints text well on plain paper; excellent manual; fastest of the sub-$200 printers. Color quality is a little grainy; external power supply is bulky.	655

Best Buy online www.pcworld.com/t10printers. Windows 95-certified Plug and Play All products: 906

HOW WE TEST The overall rating for both monochrome and color personal printers is based on print quality (25 percent), price (25 percent), features (15 percent), speed (10 percent), service and support (10 percent), and ease of use (15 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

GOOD NEWS if you're shopping for a printer: This summer many vendors have cut prices by as much as 25 percent. A few models on the chart now cost $20 to $100 less. Also, two new Hewlett-Packard printers debut on the Top 10: One, the monochrome LaserJet 6Lse, earned a Best Buy. The other was the $199 DeskJet 672C, a bargain ink jet that placed fifth on the color chart.

Printers we tested that didn't make the Top 10 include the ▶

$499 HP DeskJet 1000C and the $299 Lexmark 2055 Color Jetprinter, and the $509 Okidata OL610e and the $629 OL810e LED monochrome printers, which we retested with updated drivers.

You'll find better deals on several Top 10 printers. The NEC SuperScript 860 fell from $449 to $399 and rose two positions on the chart. Faster and more capable, the SuperScript 860 overshadowed the Panasonic KX-P6500, despite its more dramatic cut from $449 to $349. On the color chart, the Canon BJC-4200 Photo fell from $299 to $279 and gained a point in its overall rating. HP cut the DeskJet 820Cse from $399 to $299; it rose to number four. It now costs the same as the second-ranked HP DeskJet 694C. The DeskJet 820Cse's speed appeals more to business users, while the DeskJet 694C's photo inks and papers give it better color capabilities for home and artistic use.

HP IMPROVES LASERJET SPEED

THE NEW $399 HP LaserJet 6Lse improved upon the most glaring fault of its predecessor, the LaserJet 5L Xtra: slow text speed. In our tests, the 6Lse printed text at 5 pages per minute compared with the 5L Xtra's poky 3.8 ppm. Surprisingly, however, the LaserJet 6Lse's 1.8-ppm graphics speed in our tests was slower than the LaserJet 5L Xtra's 2.4-ppm rate.

Despite its improved text speed, the LaserJet 6Lse is still the slowest laser on the chart. But it didn't need much to jump over the Brother HL-720 and become the higher of our two monochrome Best Buys. The LaserJet 6Lse outstrips the Brother HL-720 in print quality and ease of use. Text and line art are impeccable, and gray-scale images are subtly shaded. Installing and maintaining the printer is a snap. The manual is well organized.

The LaserJet 6Lse's two noticeable faults: The input tray is rather small at just 100 sheets—most other monochrome printers on the chart take 150 sheets or more. And its software bundle consists mostly of Microsoft application trial versions, more promotional than useful.

A $199 PRINTER MAKES THE CUT

ON THE COLOR CHART, HP's new DeskJet 672C takes fifth place thanks largely to its very low price. The DeskJet 672C is basic—it lacks bundled software, and it can't use special photo inks or do T-shirt transfers and the like. Compared with the other sub-$200 color printers we've tested, however, the DeskJet 672C is faster, and its plain-paper text quality is the best. Color quality is a little grainy, but it's fine for most graphics except photos.

The DeskJet 672C is very easy to use. The manual is thorough and detailed. Unlike other low-end printers, the DeskJet 672C doesn't sacrifice basic parts like an output tray. The only thing we didn't like was its external AC adapter, which is bigger and heavier than most we've seen. It's a clunky addition to the rat's nest of wires and cables found under a typical desk.

A NEW BEST BUY, HP's LaserJet 6Lse is faster than its predecessor. It also has excellent print quality and ease of use.

Another new HP printer, the DeskJet 1000C, didn't make the chart because of its high $499 price. Nevertheless, businesses that need to make their own signs or promotional posters, or artistic types who want a bigger canvas, will like its wide-format design. The DeskJet 1000C can take regular-size paper, sheets up to 13 inches wide and 19 inches long, and 13-inch-wide banners. Its software can make posters, print booklets, and put reduced images of multiple pages on a single page ("n-up" printing). The DeskJet 1000C has good print quality and speed, a useful software bundle including Corel PrintHouse Select and MyColorMarketing Materials, and helpful documentation.

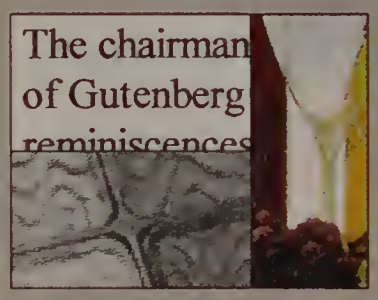
Although the printer didn't make our chart, small business startups may appreciate the useful software that comes with the $299 Lexmark Color Jetprinter 2055, including Peachtree's First Accounting. The 2055's color quality was impressive, especially on flesh tones and other natural colors. Unfortunately, it's very slow, and its monochrome print quality is mediocre: Text looks feathery, and gray-scale images lack subtle gradations.

The Okidata printers we retested, the 6-ppm OL610e and the 8-ppm OL810e, were too expensive to make the chart. In addition, the OL610e's 300-dpi print engine outputs jagged-looking text and overly dark gray-scale images.

—Dan Littman and Melissa Riofrio ■

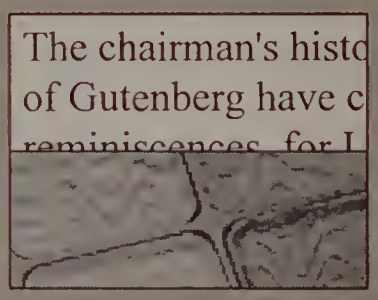
PRINT QUALITY SAMPLES

HP Printers Excel in Text Quality



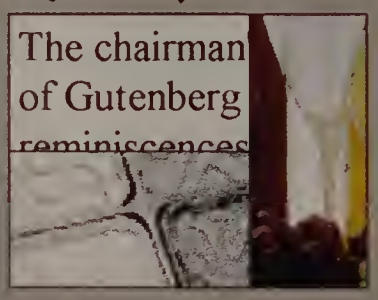
HP DESKJET 672C

HP's lowest-cost ink jet offers good text quality. Color quality, especially in photographs, looks somewhat grainy but is still adequate for most home projects.



HP LASERJET 6LSE

This new laser has superior text quality, and in our tests its subtle gray-scale quality surpasses that of many other personal lasers we've tested.



LEXMARK COLOR JETPRINTER 2055

The Lexmark didn't make the chart, but it had impressive color quality. Text looks somewhat feathery, though.

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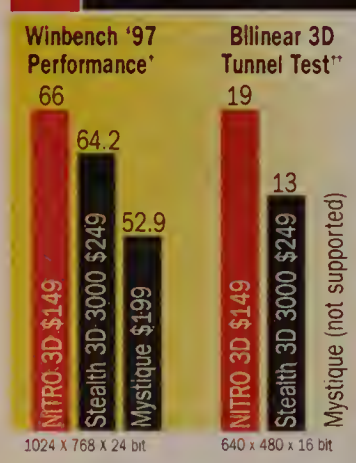

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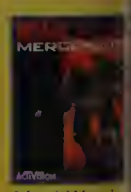


MechWarric
Mercenarie

Spycraft: Th
Great Game

PC WORLD

TOP 10 MONITORS

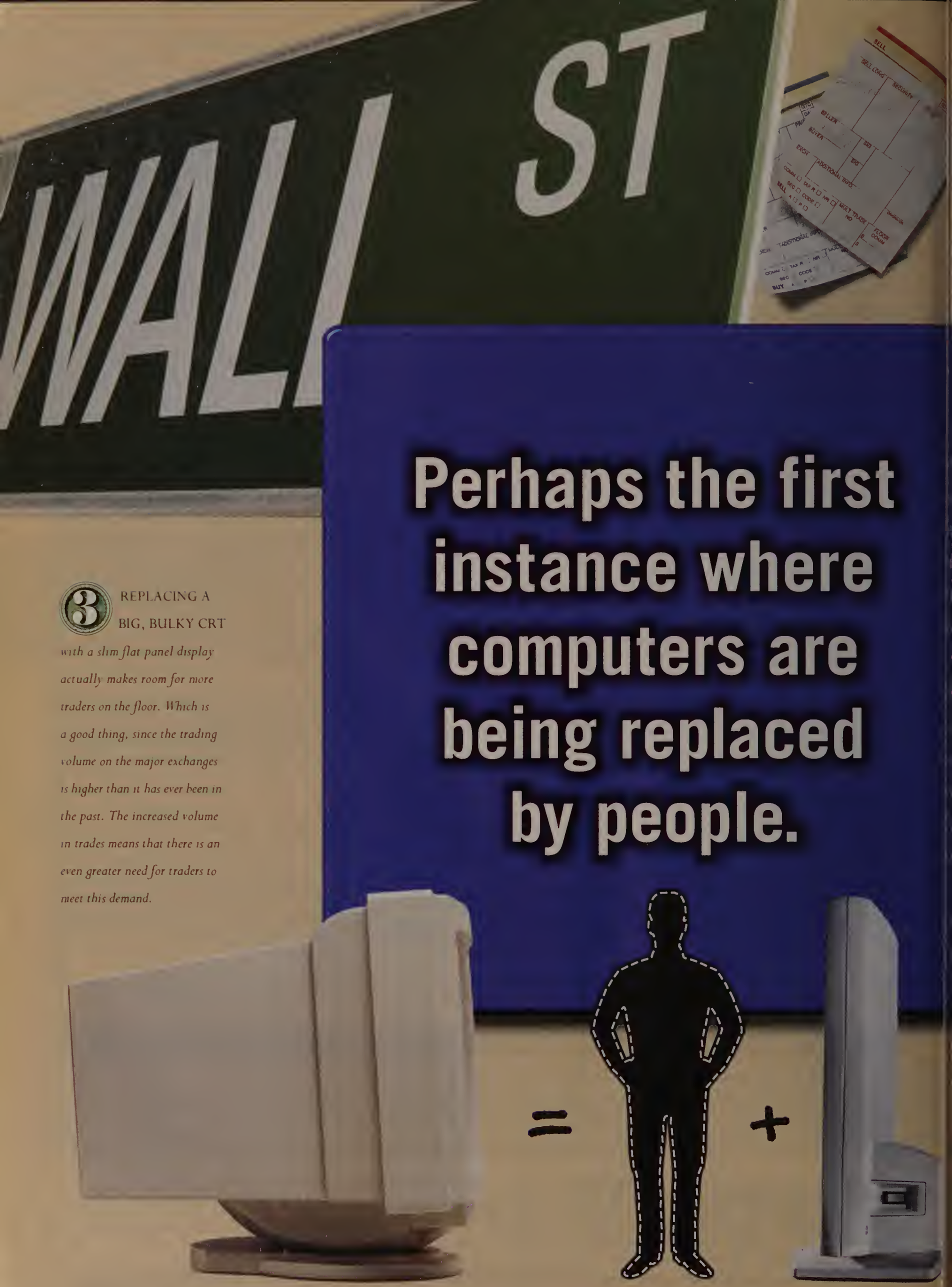
	15-INCH MONITORS	Month tested	Street price (5/21/97)	Overall rating	Quality of text/graphics	Comments	Reader service number
1	Dell UltraScan 800HS 800/289-3355 www.dell.com	Feb 97	$399	83	excellent/ excellent	**FEATURES:** 13.7-inch viewable screen, .25mm stripe pitch Trinitron tube, up to 110-Hz refresh rate,[1] Plug and Play ready,[2] 24-hour toll-free tech support. **PRO/CON:** Terrific text and graphics detail, easy-to-use on-screen gauges; brief one-year warranty, very faint line across screen, expensive.	721
2	Nokia Multigraph 449Xa 800/296-6542 www.nokia.com	June 97	$399	82	very good/ very good	**FEATURES:** 13.8-inch viewable screen, .25mm stripe pitch Diamondtron tube, up to 80-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty, 12-hour weekday toll-free technical support. **PRO/CON:** Sharp text and graphics, speakers, extensive on-screen controls, color-adjustment software, TCO-95 compliant; expensive.	722
3	Panasonic PanaSync/Pro P15 800/742-8086 www.panasonic.com	June 97	$349	81	very good/ very good	**FEATURES:** 14-inch viewable screen, .27mm dot pitch tube, up to 75-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty, 24-hour toll-free tech support. **PRO/CON:** $50 price drop, fine text and detailed color graphics, large viewable screen, easy-to-adjust on-screen controls; lacks tilt control to level a crooked picture.	723
4	Hitachi SuperScan Pro 500 800/441-4832 www.nsa-hitachi.com	Apr 97	$349	81	very good/ very good	**FEATURES:** 13.6-inch viewable screen, .28mm dot pitch tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty, 8-hour daily toll-free technical support. **PRO/CON:** Very crisp text detail, accurate color graphics; small viewable screen, tedious button pressing required to navigate on-screen menus.	724
5	Panasonic PanaMedia PM 15 800/742-8086 www.panasonic.com	June 96	$349	81	very good/ good	**FEATURES:** 14-inch viewable screen, .27mm dot pitch tube, up to 107-Hz refresh rate,[1] Plug and Play ready,[2] speakers and mike, three-year warranty, 24-hour toll-free support. **PRO/CON:** $50 price drop, big viewable screen, very sharp text, ample on-screen controls; easy-to-adjust screen is a little less bright in the corners.	725
6	CLR VisionPro 15 800/611-1555 www.clrusa.com	Apr 97	$272	80	very good/ good	**FEATURES:** 13.6-inch viewable screen, .28mm dot pitch tube, up to 75-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty. **PRO/CON:** Lowest price on chart, easy-to-read text, bright color, ample on-screen menus; graphics could be more distinct, some adjustments take too many clicks, small viewable screen.	726
7	Gateway 2000 CrystalScan 500 800/846-2000 www.gateway.com	NEW	$345	80	very good/ good	**FEATURES:** 13.9-inch viewable screen, .27mm dot pitch tube, up to 75-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty, 24-hour daily toll-free support. **PRO/CON:** Low price, big viewable screen, crisp and well-focused text, liberal assortment of on-screen controls; hard to discern what controls do in different modes.	727
8	ViewSonic 15GS 800/888-8583 www.viewsonic.com	Feb 97	$355	79	good/ very good	**FEATURES:** 13.8-inch viewable screen, .28mm dot pitch tube, up to 108-Hz refresh rate,[1] Plug and Play ready,[2] three-year warranty, 11-hour weekday toll-free support. **PRO/CON:** Very crisp graphics, TCO-92 compliant; text could be sharper, controls require repetitive button pressing, no image tilt control.	728
9	MAG InnoVision DX15T 800/827-3998 www.maginnovision.com	Aug 96	$359	79	very good/ very good	**FEATURES:** 13.9-inch viewable screen, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] limited three-year warranty. **PRO/CON:** Sharp text—even with small type—and realistic color graphics; navigating to some on-screen menu items is complicated, faint line across screen.	729
10	Mitsubishi Diamond Scan 15VX 800/843-2515 www.mitsubishi-display.com	Oct 96	$350	79	good/ good	**FEATURES:** 13.8-inch viewable screen, .28mm dot pitch tube, up to 90-Hz refresh rate,[1] Plug and Play ready,[2] image correction software, three-year warranty, 8.5-hour weekday toll-free support. **PRO/CON:** $60 price drop, detailed text and graphics, ample menus; no degauss button to manually demagnetize the tube.	730

Best Buy For expanded reviews, visit www.pcworld.com/t10monitors. All products: 910

[1] Highest refresh rate at 1024 by 768 resolution. [2] Plug and Play monitors and graphics cards can communicate bidirectionally. However, Windows 95 does not fully utilize monitor Plug and Play.

HOW WE TEST Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, spreadsheets, Web pages, and scanned images. The overall rating is based on price (30 percent), features and ease of use (25 percent), text and graphics quality (20 percent each), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

DELL AND NOKIA are tops again, though the latter barely fends off the less expensive PanaSync/Pro P15. The CLR VisionPro 15—now $58 cheaper—rises to number six, and the Mitsubishi at number ten comes back with a $60 price drop. Gateway's redesigned CrystalScan 500 debuts at number seven with fine text and an affordable price. And Samsung's SyncMaster 500b, which replaces the SyncMaster 15GLi, just missed the chart. ■



3 REPLACING A BIG, BULKY CRT *with a slim flat panel display actually makes room for more traders on the floor. Which is a good thing, since the trading volume on the major exchanges is higher than it has ever been in the past. The increased volume in trades means that there is an even greater need for traders to meet this demand.*

MultiSync is a registered trademark and LCD2000, LCD400, XtraView, "Expect more. Experience more." and the NEC Technologies icon are trademarks of NEC Technologies, Inc. All other trademarks

1 IN A FREE MARKET ECONOMY, *companies are always competing for capital. In fact, the market has never been more competitive than it is today. This increases the number of specialists needed to trade stocks. It also puts an additional burden on the technology needed to support this effort, since traders need to constantly view as many as four or five displays to stay abreast of market news and economic data.*

NEC MultiSync LCD2000
20.1" Viewable LCD Monitor

Wall Street at least, it pears that less may actually more. Because replacing big, lky, energy-hogging CRTs with slim flat nel displays allows you to put more traders the floor of the exchange.

Take NEC Technologies' new MultiSync® D monitors, including the world's first mmercially available 20.1" viewable LCD onitor. These remarkable flat panel displays ke up 60% less space and weigh 70% less an a traditional monitor. Size, however, is t all that sets them apart.

Our XtraView™ technology ables clear and accurate ewing of the screen at virtually any angle (which comes in handy when you're straining to see over the shoulder of another trader). These monitors produce a brighter, sharper image than many CRTs. They eliminate eye-fatiguing flicker (which traders will appreciate since they have to keep an eye on so many displays). They also consume up to 50% less power and have much lower emissions. Plus they're compatible with most PCs, Macs and workstations.

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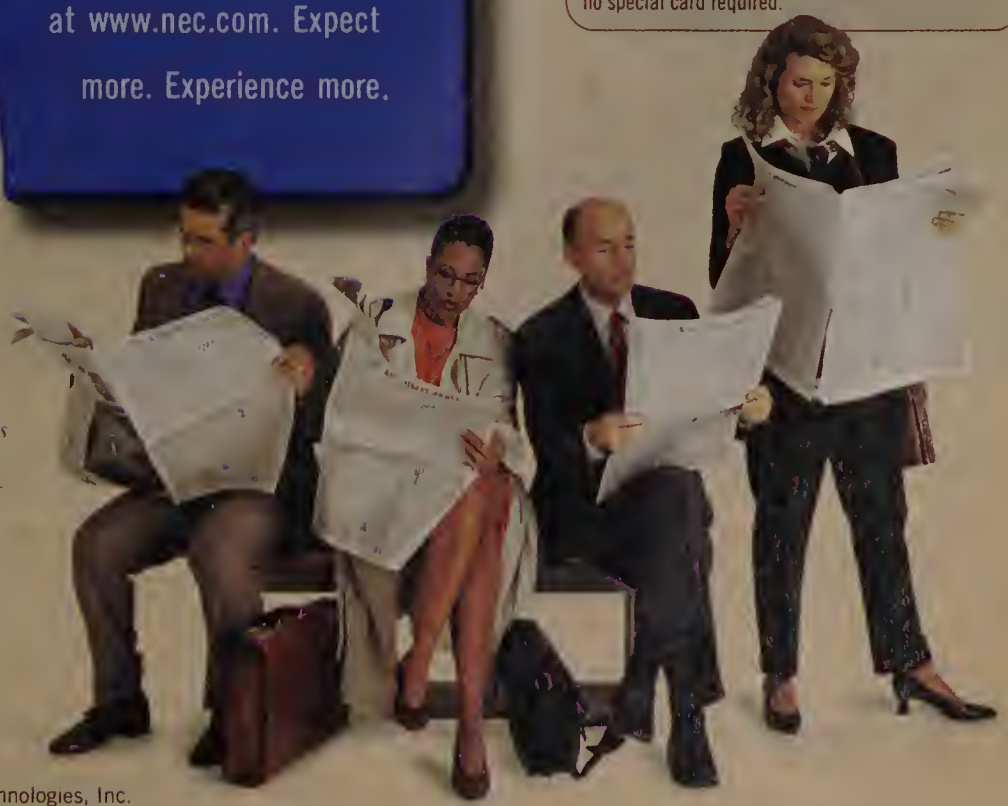
NEC
NEC Technologies

2 THE TRADING FLOOR *is crowded with specialists. The trading floor is also crowded with big, bulky CRTs that take up precious room. These CRTs also hog energy and produce a tremendous amount of heat. (Besides, as any trader will tell you, it's already "hot" enough on the trading floor.)*

MultiSync® LCD Monitor Series		
	LCD2000™	LCD400™
Viewable Size	20.1"	14.1"
Maximum Resolution	1280 x 1024	1024 x 768
Weight	22.0 lbs	11.5 lbs
Dimensions (W, H, D)	19.7 x 19 x 8.7"	14.1 x 14.3 x 6.7"
Brightness	150 cd/m²	180 cd/m²
Viewing Angle	160° conical XtraView technology	160° conical XtraView technology

Both models are compatible with PC, Mac, workstation or any VESA compliant analog RGB signal, no special card required.



4 MORE TRADERS MEANS MORE TRADES, *which means more money. (And let's be completely frank, shall we, what financial person doesn't like news like that?) In fact, one could even argue that migrating from big, bulky CRTs to slim flat panel monitors like the MultiSync LCD2000 could actually put a positive spin on the term 'downsizing'.*

Circle 201 on reader service card

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PC WORLD

TOP 10 GRAPHICS BOARDS

	GRAPHICS BOARDS	Month tested	Street price (5/19/97)	Overall rating	PC WorldBench graphics score	Comments	Reader service number
1	STB Nitro 3D 888/234-8750 www.stb.com	July 97	$149	104	189 very good	**FEATURES:** 4MB of EDO DRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Active Movie MPEG player, S3 Virge/GX chip, optional TV tuner. **PRO/CON:** Fast 2-D and 3-D performance, excellent AVI and MPEG playback, lifetime warranty; all components not automatically installed.	637
2	Hercules Terminator 3D/DX 800/532-0600 www.hercules.com	June 97	$149	104	189 very good	**FEATURES:** 4MB of EDO DRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Xing MPEG software, S3 Virge/DX chip. **PRO/CON:** 2-D and 3-D graphics improved over Terminator 3D, excellent MPEG playback, good software; mediocre AVI playback.	638
3	Matrox Mystique 220 Business 800/361-1408 www.matrox.com/mga	NEW	$179	103	188 very good	**FEATURES:** 4MB of SGRAM, 140-Hz refresh rate at 1024 by 768, bilinear video interpolation, Compcore 2.2 MPEG software, Matrox MGA-1164SG chip, optional video editing card. **PRO/CON:** Easy installation, clear documentation, good quality MPEG and AVI playback; no hardware filtering for smooth 3-D images.	639
4	ATI 3D Xpression+ PC2TV 905/882-2600 www.atitech.ca	Jan 97	$129	102	180 very good	**FEATURES:** 4MB of SDRAM, 150-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, ATI MPEG player, ATI Rage II chip, bundled games and 3-D graphics programs. **PRO/CON:** $60 price drop, connects to a TV, excellent AVI and MPEG video; 3-D quality merely okay, relatively slow 2-D.	640
5	Diamond Stealth 3D 3000XL 800/468-5846 www.diamondmm.com	Mar 97	$200	102	184 very good	**FEATURES:** 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Mediamatics MPEG software, S3 Virge/VX chip, bundled games. **PRO/CON:** Good for graphical apps, great software utilities, excellent AVI and video playback; expensive.	641
6	STB Velocity 3D 888/234-8750 www.stb.com	Feb 97	$199	101	187 very good	**FEATURES:** 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Mediamatics MPEG software, S3 Virge/VX chip, bundled games. **PRO/CON:** Good for graphically intense programs, memory upgradable, lifetime warranty; mediocre AVI and MPEG video playback.	642
7	STB Lightspeed 128 888/234-8750 www.stb.com	Aug 96	$99	101	186 very good	**FEATURES:** 2.25MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bilinear video interpolation, Xing MPEG software, Tseng Labs ET6000 chip. **PRO/CON:** Performs well with business and graphics programs, perfect AVI video playback, excellent MPEG, lifetime warranty, low price; no 3-D acceleration.	643
8	Diamond Stealth 3D 2000 Pro 800/468-5846 www.diamondmm.com	July 97	$150	100	182 very good	**FEATURES:** 4MB of EDO DRAM, 100-Hz refresh rate at 1024 by 768, bilinear video interpolation, Mediamatics MPEG player, S3 Virge/DX chip, bundled multimedia software. **PRO/CON:** Excellent MPEG and AVI video playback; software difficult to install, performance could be better.	644
9	Matrox Millennium 800/361-1408 www.matrox.com/mga	Apr 97	$219	100	187 very good	**FEATURES:** 4MB of WRAM, 120-Hz refresh rate at 1024 by 768, Compcore MPEG software, Matrox MGA-2064W chip, bundled game and 3-D graphics program. **PRO/CON:** Fast, superb AVI and MPEG video, great software utilities, upgradable memory; expensive, no bilinear interpolation for sharp images.	645
10	VideoLogic GrafixStar 600 800/578-5644 www.videologic.com	Apr 97	$149	99	189 very good	**FEATURES:** 4MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bilinear video interpolation, Xing MPEG software, Tseng Labs ET6000 chip, bundled multimedia apps. **PRO/CON:** Very fast 2-D performance, excellent software utilities; no 3-D acceleration, average AVI and MPEG performance.	646

Best Buy For expanded reviews, visit www.pcworld.com/t10graphics. Windows 95 Plug and Play All products: 905

HOW WE TEST We tested PCI boards under Windows 95 with PC WorldBench 1.0 at 800 by 600 resolution and 16.8 million colors (reported here) and at 1024 by 768 and 65,536 colors. Boards were tested in a Dell Dimension XPS P133c with 16MB of EDO DRAM and 256K of pipeline-burst secondary cache. The overall rating is based on performance (40 percent), features (30 percent), price (20 percent), and support policies (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

THIS MONTH'S NEW number three graphics board, the Matrox Mystique 220 Business, is a faster, more powerful version of the Matrox Mystique, which was on our chart for three months. It offers higher refresh rates and better 2-D performance. Matrox is selling the card in two flavors: the Business version on our chart, which comes with productivity software, and the Mystique 220, packaged with games for the home user. ■

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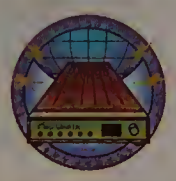
PC WORLD

TOP 10 MODEMS

	EXTERNAL MODEMS	Month tested	Street price (5/15/97)	Overall rating	Average transfer time per MB (min:sec)	Comments	Reader service number
1	U.S. Robotics Courier V.Everything 56k 800/877-2677 www.usr.com	retested this month	$285	81	2:26	FEATURES: 56-kbps, FlashROM, distinctive ring, 115.2-kbps modem-to-PC speed, callback, password, Caller ID, RapidComm Win/DOS fax/data software. PRO/CON: Fastest modem on the chart, great documentation, toll-free tech support, manual volume control, 33.6-kbps version also a good buy; expensive.	616
2	Diamond Multimedia SupraSonic 336V+ 800/727-8772 www.diamondmm.com	NEW	$199	80	2:44	FEATURES: 33.6-kbps, FlashROM, distinctive ring, 115.2-kbps modem-to-PC speed; comes with serial cable, headphones, microphone, ComIt voice/fax/data software, Caller ID; voice enabled. PRO/CON: Loaded with features, weekend tech support, SupraFax voiceless sibling also a good buy; expensive.	617
3	Practical Peripherals PC288LCD V.34 770/840-9966 www.practinet.com	retested this month	$329	79	2:28	FEATURES: 28.8-kbps, distinctive ring, stores multiple profiles, 230.4-kbps modem-to-PC speed, QuickLink II fax/data software, Caller ID, lifetime warranty. PRO/CON: Amazingly fast for 28.8-kbps modem, LCD English-language status display, loaded with features; most expensive modem on chart.	618
4	Zoom Fax/Modem V.34X Plus 800/631-3116 www.zoomtel.com	retested this month	$99	79	2:52	FEATURES: 33.6-kbps, MNP-10EC error control, 115.2-kbps modem-to-PC speed, distinctive ring, DOS/WinFax Lite fax/data software, stores multiple profiles. PRO/CON: $20 price drop brings it below $100, easy-to-follow documentation, seven-year warranty; slowest modem on chart, no security features.	619
5	Motorola ISG Premier 33.6 800/566-3266 www.mot.com/modems	retested this month	$230	77	2:28	FEATURES: 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, distinctive ring, QuickLink II fax/data software, stores 20 profiles. PRO/CON: Among the fastest we've tested, toll-free technical support, 30-day money-back guarantee; on the expensive side overall, documentation not for novices.	620
	PC CARD MODEMS						
1	Practical Peripherals ProClass 336 V.34 Data/Fax PC Card with EZ-Port 770/840-9966 www.practinet.com	NEW	$159	86	2:41	FEATURES: 33.6-kbps, FlashROM, distinctive ring, 230.4-kbps modem-to-PC speed, Caller ID, QuickLink II fax/data software, built-in phone jack. PRO/CON: Lowest price on PC Card chart, above-average performance, cross-ship replacement, full security includes password and callback; awful documentation.	621
2	Motorola Montana 33.6 800/427-2624 www.mot.com/pccards	retested this month	$199	86	2:38	FEATURES: 33.6-kbps, FlashROM, direct cellular connection, 115.2-kbps modem-to-PC speed, QuickLink Mobile fax/data software, digital line protection with alert. PRO/CON: Moderate price, good for cellular use, great documentation, toll-free tech support, above-average performance; not many features.	622
3	Megahertz U.S. Robotics XJ1336 800/527-8677 www.usr.com/mobileusr	NEW	$239	84	2:32	FEATURES: 33.6-kbps, FlashROM, built-in phone jack, 230.4-kbps modem-to-PC speed, digital line-voltage protection, FaxWorks fax/data software, stores multiple profiles. PRO/CON: Fastest modem on PC Card chart, extensive online documentation, voice-enabled XJ4336 also a good buy; expensive.	623
4	U.S. Robotics Sportster 33.6 Faxmodem 800/527-8677 www.usr.com/mobileusr	NEW	$229	82	2:38	FEATURES: 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, digital line-voltage protection, FaxWorks fax/data software, stores multiple profiles. PRO/CON: Above-average performance, very good documentation; on the expensive side, no weekend tech support, no cross-ship replacement.	624
5	TDK CyberExpress 3000 800/999-4835 www.tdk.com	retested this month	$179	78	3:20	FEATURES: 33.6-kbps, MNP10, MNP-10EC error control, FlashROM, 115.2-kbps modem-to-PC speed, digital line-voltage protection, QuickLink II fax/data software, stores multiple profiles. PRO/CON: Support package includes toll-free technical support, five-year warranty; very slow.	625

Best Buy For expanded reviews, visit www.pcworld.com/t10modems. Windows 95-certified Plug and Play All products: 903

HOW WE TEST We test a pair of identical modems on a simulated phone network. For the phone line test, we send a text file over 55 line conditions. For the file type test, we send five files—graphics, text, program, and compressed file types, plus a mixture of these four types—over one line condition. We then average the results of the two tests. Overall rating is based on performance (43 percent), features (26 percent), price (12 percent), support (10 percent), and ease of use (9 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



THE U.S. ROBOTICS Courier V.Everything 56k moved to number one this month on the External Modems chart after we adjusted our sheets to reflect the pricing of today's modems. The Courier was tested only at its 33.6-kbps speed; in September we'll start testing at 56 kbps as well. On the PC Card chart, Practical Peripherals' ProClass 336 V.34 Data/Fax PC Card with EZ-Port replaces the 28.8-kbps version and becomes our other new Best Buy. ■

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FEATURE	XPERT@Play	Matrox Mystique	Diamond Monster 3D
Triangle Setup Engine	●		
Bilinear/Trilinear Filtering	●		●
Texture Decompression	●		●
Alpha Blending/Fog	●		●
Standard Max. Memory	8MB	4MB	4MB
DVD-Quality Video	●		
2D Acceleration (Win 95)	120M	103M	n/a

KILLER 3D PERFORMANCE[1]

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—*Mark Grossman*

Quicken Family Lawyer Deluxe

GRADE: **A**; PRICE: $49 street; Parsons Technology; 888/883-0791; www.parsonstech.com

READER SERVICE NO. 714

DOCTOR, DOCTOR

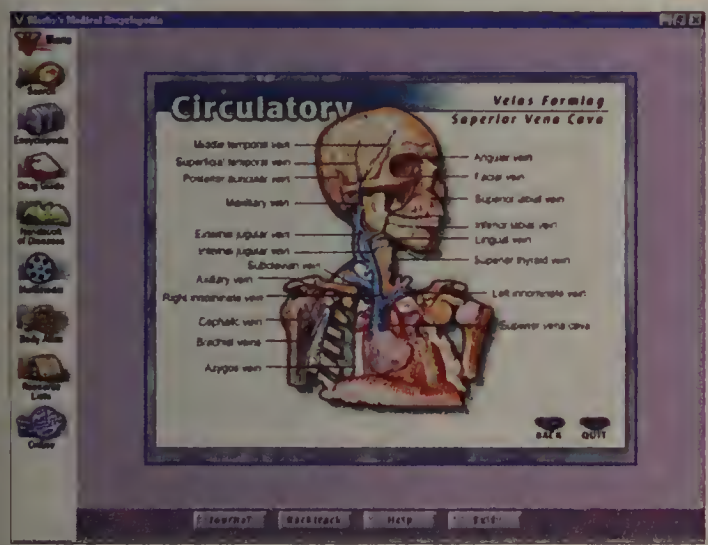
YOU WAKE UP at 2 A.M. with burning stomach pains. You need an electronic medical adviser that can tell you if those pains warrant a wee-hours trip to the emergency room. Unfortunately, neither **Home Medical Advisor** nor **Mosby's Medical Encyclopedia** truly accomplishes this task. Their texts are mostly in medical lingo, and "first aid" for common problems is scant. Both programs do include ample anatomy lessons, drug listings, and Web links. They can also be fun to browse if you're a hypochondriac looking for exotic conditions to worry about. Mosby's has a more attractive interface, but HMA's three-disc set boasts more photos and videos, including some gory graphics. HMA also offers interactive videos to help diagnose some conditions, and an area where the program assesses your health risks based on your medical history. These two CD-ROMs are fascinating references, but look elsewhere if you need more in-depth medical advice.

—*Naomi Wise*

Home Medical Advisor

GRADE: **C**; PRICE: $50 street; The Learning Company; 800/852-9952; www.learningco.com

READER SERVICE NO. 715



THE BODY ELECTRONIC: Mosby's Medical Encyclopedia offers a wealth of information about the human body.

Mosby's Medical Encyclopedia

GRADE: **C**; PRICE: $45 street; The Learning Company; 800/227-5609; www.learningco.com

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WANT TO FIND OUT the definition of plate tectonics, or why carbon is the basis of life as we know it? Or do you just want to browse through the mass of scien- ▶

Old Players, New Tricks

I'VE GOT A SECRET: I love playing games (especially shoot-'em-ups), but I'm always getting skunked by my 16-year-old nephew. But with a SpaceOrb 360, youth and skill take a backseat to experience and treachery. This gizmo gives me tons more control than even a joystick does. Its secret is a ball that I twist, pull, and push to whiz around corners, jump into cubbyholes, and dash through corridors. Six programmable buttons add to my deadly navigational skills. The SpaceOrb works with most popular games, including Doom, Quake, Duke Nukem 3D, MechWarrior 2, and Descent I and II. The only downside is that it needs a free COM port. If you see me online, watch out—I'm ready for you. I've got a SpaceOrb. **—Steve Bass**

SpaceOrb 360

GRADE: **A+**; PRICE: $89 street; Spacetec IMC; 508/275-6100; www.spacetec.com/

READER SERVICE NO. 717

TAKE CONTROL: Sharpen your shoot-'em-up skills with the SpaceOrb game controller.

EDITED BY Christina Wood

PHOTOGRAPH ROBERT CARDIN

tific knowledge that famed physicist Stephen Hawking has integrated into his seemingly superhuman brain? Either way, **Life in the Universe** will provide hours of intellectually intense entertainment. Its extrapolations of Hawking's lectures about the origins of life include gorgeously animated terrains, scrollable timelines, *Scientific American* articles, challenging games, and Web links. Phage, the cutest navigator this side of R2-D2, keeps track of your accumulated knowledge. Designed to break you of linear thinking habits, Life in the Universe immerses you in a vortex of theory and fact.

—Derk Richardson

Life in the Universe

GRADE: **A**; PRICE: $39.95 list; MetaTools; 800/472-9025; www.metatools.com

READER SERVICE NO. 718

SPACED OUT

I PULLED UP to the counter in the Thirsty Tentacle (aka **The Space Bar**) and began my adventure as Alias Node, a space cop looking for the shape-shifting thief who kidnapped my partner. I like a good game but I'm not a hard-core gamer or a sci-fi maven. By the end of an evening in this place, I was feeling the need for a real drink. In order to track down my partner, I had to rely heavily on telepathic conversations with the other characters, delving into their memories for clues. But while I found the game's graphics impressive, the entire experience annoyed me: My PDA kept popping up on screen, and I quickly wanted off the crazy merry-go-round of first-person navigation. Hey, if you're a science-fiction nut, loved *Independence Day*, and can't get enough of *The X-Files*, you'll likely have a good time at The Space Bar. Send me a postcard. *—Gabrielle Mitchell*

BELLY UP TO THE BAR: Aliens like this bartender are the keys to solving the mystery behind The Space Bar.

The Space Bar

GRADE: **B-**; PRICE: $50 street; SegaSoft; 888/734-2763; www.segasoft.com

READER SERVICE NO. 719

HIDE AND SEEK

IF YOU'VE EVER leafed through a dog-eared copy of *Highlights* magazine at the pediatrician's office, you've probably played Hidden Pictures—you know, that mesmerizing children's game in which you squint at black-and-white line drawings in search of cleverly hidden umbrellas, kittens, and other random objects. Well, now your kids can fire up the home PC and play an enhanced version featuring animation, sound, and even an art studio that lets them create and print their own masterpieces. **Highlights Hidden Pictures Workshop** offers 40 drawings to choose from, each containing 12 to 20 hidden objects. Three difficulty levels and ample clues let even prereaders finish a puzzle, but navigation can be awkward, especially for younger users. Also, anyone who's spent an hour or so peering at small images on a computer screen knows the strain it can put on the eyes—so parents, don't cancel that *Highlights* subscription yet, or you'll be leafing through back issues at the ophthalmologist's office. *—Anne Kandra*

Highlights Hidden Pictures Workshop

GRADE: **B-**; PRICE: $30 street; Palladium Interactive; 800/910-2696; www.palladiumnet.com

READER SERVICE NO. 720 ■

F Y I

KIDS AREN'T AT the mall anymore. They're online. In 1996 the number of children age 2 to 17 using online services nearly doubled over 1995 levels—reaching over 4 million.

SOURCE: JUPITER COMMUNICATIONS CONSUMER CONTENT GROUP

KEEPING UP

Getting Answers Quick

PICTURE THIS: You've got a little time to yourself and grab the opportunity to fire up that mindless game you just bought. It crashes during installation. Do you really want to spend your free time on troubleshooting? If it's a Microsoft product, try going over to www.microsoft.com/support/ and check out the new Support Wizards at Microsoft's technical support forum. The wizards will run diagnostics on your system, search the knowledgebase for other problems like yours, and suggest the solution that has the highest probability of fixing the problem. The service is available for any Microsoft product and is free for consumer products and Microsoft Office (if you bought a retail version). It's not game play, but it's pretty neat technology.

Making a Big Purchase?

EVERY TIME YOU buy something, you feel that pressure to log hours of research first, right? How much will an ice maker on a new fridge set you back? Do you need digital zoom on the video camera? How much do you have to spend to get a camera you'll be happy with? Well, check out www.compare.net. Tell it what you're planning to buy, and it quizzes you about design particulars and how much you want to pay. Then it provides a table of products with features and prices. The list isn't complete, so don't treat it as an all-knowing source, but at least it prepares you for a trip to the retail outlet.

Software for Rent

HOW ABOUT IF you paid a little bit every time you used a software package instead of buying it outright? That's the plan with Knowledgepoints' Descriptions Now, a program that helps you write a job description. Surf on over to www.jobdescription.com, pay your $7.95, and follow the on-screen instructions. The site will walk you through creating a job description that complies with the Americans With Disabilities Act; you can then download your creation and edit it.

–Christina Wood

"I COULDN'T BELIEVE MY EYES!"

If it weren't for Family Tree Maker,™ I would never have found my family

Using Family Tree Maker, Diana found her great-great grandparents Hannah & William Hunt Wilson.

Dear Family Tree Maker,

I became interested in genealogy because I never knew my ethnic heritage. The only ancestor name and location I knew of was that of my great-great grandfather, William Hunt Wilson who lived in Oregon.

I then decided to purchase a genealogy program, and chose Family Tree Maker because of the FamilyFinder Index. I went home, loaded the program, did a search in the FamilyFinder Index using my great-great grandfather's name, and it referenced a World Family Tree CD*. I couldn't believe my eyes!

I found the name "William Hunt Wilson" on the CD. The family tree was huge — hundreds of names! My name was not there, so I decided to contact the tree's contributor to let her know that I found the connection. I left a message, and that night, I received the long-awaited call. The contributor, who is also my cousin, was screaming on the phone because she could not believe she had found me. I was part of a "long lost leg" that the family had not heard of for over 50 years! We laughed, we cried, and talked all night. And now, we have contact every day — either by phone or by e-mail.

A family reunion is scheduled to take place this Fall, thanks to Family Tree Maker. I would have never found my family if it wasn't for the program.

Thank you!

Diana Yashar

San Jose, CA

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*The World Family Tree CDs contain actual family trees. Submitter information is available free upon request. Family Tree™ Maker is available now for Windows 3.1, Windows 95, and Power Macintosh. Features vary according to platform and price. Additional accessory CDs sold separately. ©1997 Broderbund Software, Inc. All products are trademarks of their respective holders. Codie awarded to Deluxe Edition II, March 1997.

SOURCE CODE 1635

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Meet The Compaq Family Of Notebooks. And Take Work Home (Or Just About Anywhere Else) Today.

Wherever your work takes you, Compaq has a notebook that's perfect for the ride.

Take the Armada 1500 Family for instance. It's an all-in-one business notebook that combines all the functionality you need with an economical price. What do we mean all-in-one? For starters, you get a Pentium® processor (up to 133MHz) or a Pentium processor with MMX™ technology (up to 150MHz), dual battery support, integrated AC adapter, and built-in 33.6 data/fax modem. What's more, the Armada 1500 allows you to access your hard drive, floppy drive, and CD-ROM simultaneously.

If you've got flexibility on your mind, look to the Armada 4100 Family. It transforms from a lightweight, 1.5" slimline notebook to a multimedia notebook with an optional and detachable CD-ROM base. It can even work harder (and longer) for you when you utilize its 3-battery configuration.

Finally, there's the powerhouse Armada 7700 Family, the ultimate in notebook performance and mobile convenience. With a robust Pentium processor with MMX™ technology (up to 166MHz) and exceptional memory capability (up to 144MB, 2 slots), there's nothing to stop you from taking work wherever you go. Even if you just want to get home.

Armada 7700 Family

Armada 4100 Family

Armada 1500 Family

ARMADA	7700 Family	4100 Family	1500 Family
Processor	150MHz – 166MHz Pentium Processor with MMX™ technology	133MHz Pentium Processor – 166MHz Pentium Processor with MMX™ technology	133MHz Pentium Processor – 150MHz Pentium Processor with MMX™ technology
Display	12.1" CTFT (SVGA or 1024 x 768)	12.1" CSTN or 12.1" CTFT (SVGA)	12.1" CTFT or 12.1" CSTN (SVGA)
Standard/Max Memory	16MB or 32MB EDO RAM up to 144MB 2 slots	16MB up to 80MB	16MB EDO RAM up to 80MB
Hard Drive (SMART)	1.6GB – 2.1GB (up to 3.0GB optional)	1.4GB – 2.0GB	1.4GB – 2.1GB
CD-ROM	8X optional	8X optional	Integrated 10X
Modem	Integrated 33.6 Kbps data/fax Upgradable to K56 flex protocol*	Compaq PC Card optional	Integrated 33.6 Kbps data/fax
Integrated AC Adapter	Yes	No	Yes
Battery Type/Life**	Li-Ion up to 2.5hr (up to 2 batteries)	Li-Ion up to 2.5 – 3 hr (up to 3 batteries)	Li-Ion up to 3.5hr (up to 2 batteries)
Desktop Expansion	Convenience Base or Expansion Base (with tower stand optional)	Convenience Base (with or without Ethernet)	Convenience Base (with or without Ethernet)
Pre-installed Software	Microsoft Windows 95 or NT Workstation 4.0	Microsoft Windows 95	Microsoft Windows 95 or NT Workstation 4.0
Dimensions/Weight	2.0" x 12.6" x 9.5" /7.8 lb – 7.9 lb	Slimline: 1.49" x 11.4" x 8.8"/ 5.3 lb Standard: 1.49" x 11.6" x 10.3"/6.2 lb Multimedia: 2.3" x 12.6" x 9.5"/8.3 lb	2.1" x 12.2" x 9.6"/ 7.35 lb – 7.52 lb
Limited Warranty†	3-year worldwide limited warranty	3-year worldwide limited warranty	1-year worldwide limited warranty with optional 2-year upgrade available

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PC WORLD

TOP 5 HOME PCs

	SYSTEMS	Street price (5/1/97)	Overall rating	PC WorldBench score	Reliability/ service rating	Setup rating	Comments	Reader service number
1	Dell Dimension XPS M166s 800/388-8542 www.dell.com	$2199	89	223 outstanding	best/ best	fair	FEATURES: Pentium MMX-166, 32MB of SDRAM, 4GB hard drive, 12X CD-ROM drive, 33.6-kbps fax-modem, 15-inch monitor; comes with Microsoft Office 97 Small Business Edition but no other software. PRO/CON: Reasonably priced and loaded with hardware, faster than some Pentium MMX-200s; mail-order only.	601
2	HP Pavilion 5320 800/724-6631 www.hp.com/info/pchome1	$1848	87	180 good	good/ best	outstanding	FEATURES: Pentium 150, 16MB of RAM, 1.6GB hard drive, 8X CD-ROM drive, 33.6-kbps fax-modem, 15-inch monitor; software includes Works, Encarta 97, Quicken SE, Magic School Bus, Hansel and Gretel, and Great Word Adventure. PRO/CON: HP's lowest-price entry level machine; lacks power for high-end multimedia titles.	602
3	HP Pavilion 7370V 800/724-6631 www.hp.com/info/pchome1	$2948	86	222 outstanding	good/ best	outstanding	FEATURES: Pentium MMX-200, 32MB of RAM, 4GB hard drive, 16X CD-ROM drive, 33.6-kbps fax-modem, 15-inch monitor, game pad, 3-D video card with 4MB of RAM; software includes Works, Mech Warrior 2 for MMX, Whiplash, and SimCity 2000. PRO/CON: Super muscle machine, ideal for serious gamers; somewhat expensive.	603
4	Micron Home MPC 800/223-6571 www.micron.com	$2269	86	230 outstanding	good/ best	good	FEATURES: Pentium MMX-200, 32MB of RAM, 3.1GB hard drive, 12X CD-ROM drive, 33.6-kbps fax-modem, 17-inch monitor; includes Works, Encarta 97, and Quicken Deluxe. PRO/CON: Very fast PC for a reasonable price, suitable for home office and family entertainment; software bundle not as extensive as the HPs', mail-order only.	604
5	HP Pavilion 7350P 800/724-6631 www.hp.com/info/pchome1	$2748	85	200 good	good/ best	outstanding	FEATURES: Pentium MMX-166, 32MB of RAM, 2.5GB hard drive, 16X CD-ROM drive, 33.6-kbps fax-modem, 17-inch monitor, built-in color scanner; includes image-editing software, Adobe Photo Deluxe, and EasyPhoto. PRO/CON: Great system if you like working with art; expensive if you don't need image-editing software or scanner.	605

Best Buy — All products: 901

HOW WE TEST The overall rating is based on reliability and service (30 percent), price (20 percent), PC WorldBench performance (20 percent), setup (10 percent), compatibility (10 percent), and extra features (10 percent). Reliability and service ratings are based on results of PC World's Reliability and Service survey.

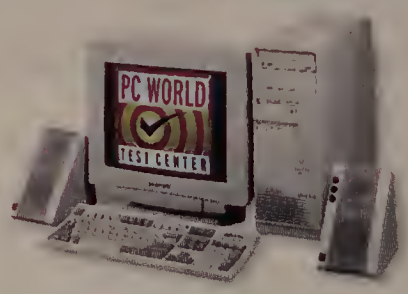
BRAND NEW THIS MONTH is Micron's MMX entry in its Home MPC line. It makes its debut at number four after Micron's two-month absence. And boy is this system a racehorse, with the fastest PC WorldBench score ever. Rounding out the chart are machines from PC makers we've seen before: Dell and HP.

For the third month in a row, Dell's Dimension XPS M166s captures the top spot. It's a winner again on the strength of its $2199 price ($150 less than last month), excellent performance, and first-class reliability and service ratings. The meaty hardware bundle and Pentium MMX processor give it the muscle to perform the toughest home office or gaming tasks. But there is a drawback: You get only one software package—Microsoft Office 97 Small Business Edition.

The number two spot belongs to the HP Pavilion 5320. At $1848, the 5320 is a great deal if your computing needs are average—you don't want to run high-end games. Its PC WorldBench score of 180—the lowest on the chart—falls far behind the scores of the latest MMX machines.

If you're a serious gamer and want a machine that can take on multimedia challenges, the third-place HP Pavilion 7370V is a better bet. It comes with a game pad, 4MB of video RAM, and 3-D graphics. But at $2948, this PC is not cheap.

Micron weighs in at number four with its Home MPC, a Pentium MMX-200. This speed demon has a PC WorldBench score of 230. For $2269, you get a 17-inch monitor and a handy Iomega Zip drive, and the software bundle includes Microsoft Works, Encarta 97, and Quicken Deluxe. We also tested the 166-MHz model, but since it's so similar to the P-200 version, we didn't give it a slot of its own. Its PC WorldBench score is 213, and it also comes with a 17-inch monitor; the price is a very reasonable $1928. Either machine would be an ideal choice for your home office or small business.



MICRON'S HOME MPC has the highest PC WorldBench score.

The HP Pavilion 7350P was pushed down a notch to number five by Micron's Home MPC. If you're interested in playing with art, video, and photos on the PC, you'll like the 7350P. It comes with a built-in 5-by-7-inch color scanner, a 17-inch monitor, and plenty of image-editing software. However, the 7350P is rather pricey at $2748.

—*Kirk Steers*

Kirk Steers is a contributing editor for PC World. *Testing performed by Ulrike Diehlmann of the PC World Test Center.* ■

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"CAN YOU COME by for dinner?" It was my mother calling, trying to set up some on-site tech support. After chatting, she got around to it: "While you're here, do you think you could upgrade my modem to 56 kbps?" No, Mom, I insisted; your old 28.8 works just fine.

My mother isn't unusual. She's just enjoying America's new favorite pastime. Everywhere I go—parties, movie lines, and sushi bars—people are reciting URLs and arguing about browsers. I won't join *that* debate, but I will recommend a few tools to cut flab from your downloads, check up on your Internet service provider, and grab e-mail while you're catching Zs.

One thing that drives me crazy about the Internet is downloading files. I'll start downloading a humongous file, get within minutes of completion, and then lose everything when my ISP disconnects me or Windows 95 throws me a GPF.

In the old BBS days of online (what, two years ago?), I could start a download, get kicked offline, and in the next session resume where I left off. Relive those days of old: Just pick up **GetRight**, unabashedly the best $17.50 utility for downloading files from the Net I've seen. It works with Win 3.*x*, Win 95, and Windows NT.

And it's a no-brainer to use. From your browser, instead of clicking the file name's link, load GetRight, then drag and drop the link onto the program's small window. After prompting you for a location to save the file, it opens a window with pause and resume buttons that let you stop and restart the download.

If you're downloading many files, GetRight shows them all in a dialog box and lets you pause, start, and set priorities. Say the word when you're ready, and it will launch the download. It lets you set up a .wav file that plays when it's done. It supports both HTTP and FTP protocols and, when you arrive at a site, lets you know if the site supports resuming. (Not all do—go to the FTP site if you have a choice.)

> **Net.Medic** looks like the dashboard of a **Ferrari** and will **impress** your friends.

CHECK UP ON YOUR ISP

WHILE YOU'RE WAITING for files to download, you might be wondering how well your modem's performing. Maybe you want to know if your ISP's up to snuff, or if the Web server is overloaded. Now you can know all with **Net.Medic**, a remarkable $49.95 program that does a thorough exam of your Internet connection.

I configured Net.Medic to display my modem's compression, its send and receive rate, my ISP's traffic congestion level, the speed between my browser and Web server, and the server's idle time. Net.Medic logs every activity and, when problems arise, sends e-mail detailing them. If nothing else, Net.Medic's interface—with gauges, dials, lights, and ticker tapes—looks like the dashboard of a Ferrari and will impress your friends.

BACKGROUND MAIL CHECKS

FEELING LIKE A slave to e-mail? Do you check your e-mail a dozen times a day just to get those three important messages, along with umpteen dull ones? Liberate yourself. Grab a copy of **Mail Spy 1.1**, a terrific—and free—application that unobtrusively checks for new mail in the background.

Mail Spy isn't feature-laden, but it's not difficult to use or configure. And it takes only about 256K of disk space. (Ain't *that* unusual?) It just sits in your Win 95 system tray, automatically dialing your ISP at intervals you set. (Sorry, but it won't work with America Online, CompuServe, or Prodigy.) If you get antsy and *must* see if you have mail, Mail Spy understands. Ask, and it will check immediately.

If the utility finds any mail, you'll get a beep or .wav file sound, a message, or both—your choice. You can even tell Mail Spy to launch your e-mail program, browser, or favorite game when a message comes in. (Why not? It might be from your boss.)

By the way, I convinced my mom to stay with her trusty USR modem, so I can eat dinner in peace. The bad news is, she's now asking me about ISDN phone lines.

GetRight
$17.50; HeadLight Software; www.headlightsw.com/
READER SERVICE NO. 634

Mail Spy 1.1
Free; SaberQuest; 801/235-1738; www.saberquest.com

Net.Medic
$49.95; VitalSigns Software; 888/984-8259; www.vitalsigns.com
READER SERVICE NO. 635

Contributing Editor Steve Bass, a licensed marriage and family therapist and president of the Pasadena IBM Users Group, can be reached at steve_bass@pcworld.com. ■

ILLUSTRATION: MARK MATCHO

It's too nice a day to play outside.

Play to learn, learn to play.

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Upgrades: ◆ 3Com® 3C905 Fast EtherLink® XL 10/100 PCI Card, add $109. ◆ 4/8GB EIDE TR4 TBU, add $199. ◆ HP LaserJet 6Pse Printer, add $799. ◆ 3-Pak of Zip 100MB Cartridges, add $39.

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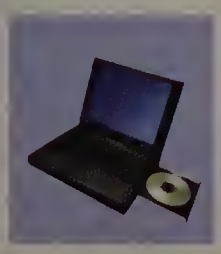

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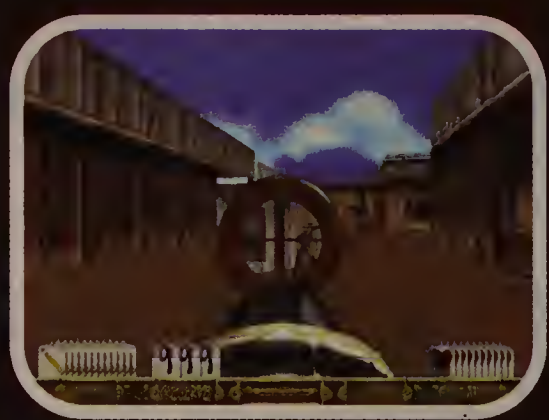

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HERE'S HOW

ANSWER LINE

Troubleshoot Windows Fatal Exception Errors

WINDOWS 95 HAS an annoying "feature": Recurring 'Fatal Exception OE' errors occur when the PC boots up. We get the errors sporadically on several of our systems, but they don't go away even when we reinstall Windows. I've tried applying every patch supplied by Microsoft, but nothing helps. I've even swapped system memory to rule out bad SIMMs, to no avail. Is there anything else I can do?

Craig Smith, West Chester, Pennsylvania

FATAL EXCEPTION ERRORS are Windows 95's way of preventing programs or drivers from performing operations in the PC's processor that aren't allowed or will destroy data. The source of the problem could be a buggy driver or program, faulty memory, or a bug in Windows 95.

Trying to run memory with the wrong BIOS wait-state settings can also generate such errors. To rule out this possibility, go into your system's CMOS setup program and choose the default wait-state settings, or experiment with different settings.

Microsoft has documented numerous Fatal Exception error problems and solutions in its online Knowledgebase. **FIGURE 1** lists the most common problems.

To read a specific Knowledgebase document, go to www.microsoft.com/kb, select *Windows 95* from the list in step 1, select *Search for a specific article ID* in step 3, enter the document's number in the search field of step 5, then click *Begin Search*. If your problem isn't listed in the Knowledgebase, read document Q136337, an extensive step-by-step troubleshooting guide to Windows 95 start-up problems, including the Fatal Exception errors.

GET A BETTER OUTLOOK

I'VE RECENTLY upgraded to Microsoft Office Professional 97 and have been trying to use Outlook 97 as my primary Internet mail application. I love the features it provides, but I'm having one major problem. I prefer to download e-mail messages from my Internet service provider's server at the end of each week, and I'd like to be able to read the messages directly from the server until then. That way I can read them again from a different computer if necessary. The settings for leaving messages on the server are easy to find in Netscape Mail and Internet Explorer's Internet Mail. Can I set Outlook to work the same way?

Kevin M. Meehan, Internet

THIS ONE DROVE ME nuts, too, until I figured out that it simply cannot be done using Outlook 97's normal mail-retrieval mechanism. If you use your modem to read Internet mail, you can work around the missing feature in Outlook by using the program's Remote Mail utility. Choose *Tools•Services*, double-click *Internet Mail* in the list of installed services, choose *Connection*, check *Work off-line and use Remote Mail*, and then click *OK* twice to make the change.

To retrieve your mail, select *Tools•Remote Mail•Connect;* this starts a Remote Connection Wizard. Check *Internet Mail* in the first screen, click *Next*, select *Do only the following*, check *Retrieve new message headers via Internet Mail*, and click *Finish*. Outlook will dial in to your Internet mail server and download only the message headers. Select all that you want to download, then choose *Tools•Remote Mail•Mark to retrieve a copy* and select *Tools•Remote Mail•Connect* again. This time, the wizard will give you the option of retrieving a copy of the message. Don't choose the 'Send and receive all messages'

By Scott Spanbauer

ILLUSTRATION: JOHN BLECK

Read Up on Fatal Windows Errors

Cause of Fatal Exception error	Document number
Wavetable audio/CMOS setting clash	Q129777
Diamond Viper video board drivers	Q131743
Adobe Type Manager/video board driver clash	Q133440
ATI Mach32 ISA settings	Q139771
Clash with Windows for Workgroups TCP/IP files	Q140903
Damaged Registry	Q145836
VPOWERD power management bug	Q153395
winipcfg.exe/DHCP/Token Ring bug	Q158713
Terminal emulation/NetWare/DLC bug	Q159344
Windows 95/Zip drive clash	Q160800
Stacker 4.1/Install Wizard clash	Q162390
Windows Sockets over IPX bug	Q163329
Windows 95 NetWare client/Directory Services bug	Q163673
SideWinder gamepad resource conflict	Q165049
HP OfficeJet/Plug and Play clash	Q166047

FIGURE 1: MICROSOFT'S KNOWLEDGEBASE tells you how to find and eliminate Fatal Exception errors.

option; it won't leave a copy on the server.

If you think that's a lot of work, join the crowd. Microsoft has posted a free Outlook upgrade, called the Internet Mail Enhancement Patch, on its Web site at www.microsoft.com/officefreestuff/outlook. The patch provides support for leaving messages on POP3 servers—the most common Internet mail server protocol. And for those of us with more than one Internet identity, it also supports multiple POP3 accounts, as well as Net-style quoting (in which text from the message you're replying to is prefixed with a special character like >).

As we went to press, the same Microsoft page already offered two other free Outlook add-ons: a Rules Wizard for processing incoming mail based on criteria you define, and a preview pane (see **FIGURE 2**), which adds a third window to the Outlook interface, displaying the contents of highlighted messages before you open them.

There's also Outlook Express, which is part of Internet Explorer 4.0. Outlook Express is a combined and upgraded version of the Mail and News programs included with Internet Explorer 3.0. Unlike Outlook, which lets you connect to Microsoft Exchange Server, Microsoft Mail, Lotus cc:Mail, CompuServe, America Online, the Internet, and fax, Outlook Express works only with Internet Mail.

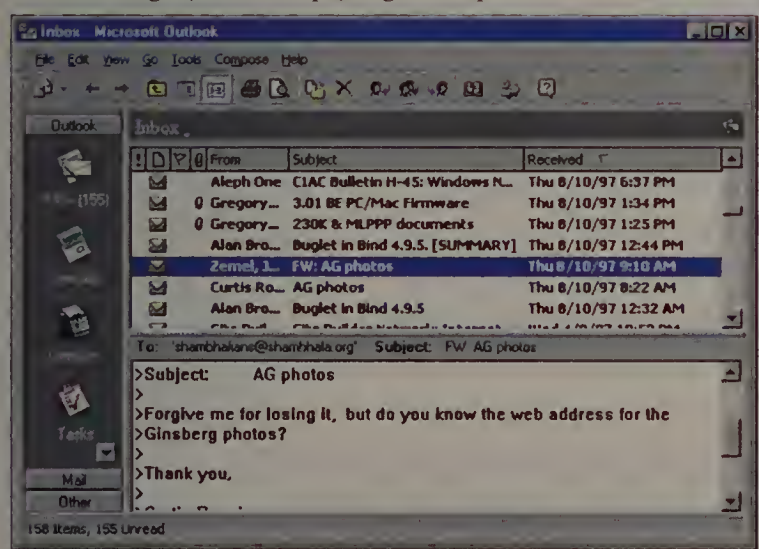

FIGURE 2: IMPROVE YOUR OUTLOOK with free add-ons from Microsoft. This preview pane lets you browse your in-box.

LET YOUR SWAP FILE ROAM

I HAVE A 1.2GB hard disk that is partitioned into C: and D: drives. Drive D:, where Windows 95 is installed, is about 120MB. I'm running out of room on this partition, and every time I install a program—even if it's on drive C:—it eats up space on D:.

I read a tip in *PC World* stating that twice as much free space should be available on the hard drive for the Windows swap file as you have installed memory. I have 16MB of RAM but only 9MB of free space on drive D:.

Can I copy my Windows installation to drive C:, or should I just uninstall Windows 95 and then reinstall it on C:? If I choose the latter option, I'll have to reinstall all of my programs, too.

Marlan Hanson, Internet

SIMPLY MOVING Windows 95 to another drive (using Explorer or the xcopy command) won't work, since all of the Registry and .ini file references to drive D: would fail. The easiest thing to do is move the swap file to another drive that has more free space; I'm assuming C: has more room.

To do that, choose *Start•Settings•Control Panel*, double-click the *System* icon, click the *Performance* tab and then *Virtual* ▶

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DON'T MISS ADDITIONAL HERE'S HOW information. Check out *PC World's* broadened Here's How coverage, including an expanded version of our *Upgrade Guide* column, at **www.pcworld.com/hereshow.**

Swap Files Between Word 97 and Earlier Versions

SO YOUR COMPANY just upgraded to Word 97. You bring home a file and try opening it using an earlier version, but all you see is garbage.

Yup, Word 97 uses a file format other versions can't read. Don't curse Microsoft; download its free Word 97 file converter from www.microsoft.com/kb/softlib/mslfiles/wrd97cnv.exe.

A service pack that fixes the problem should be out by the time you read this. Check Microsoft's Migration page for more information.

Memory, select *Let me specify my own virtual memory settings*, and choose another drive from the *Hard disk* list. Click *OK*, *Yes*, and *Close*. When you restart your PC, your hard disk should be breathing easier.

SPEED YOUR SPORTSTER, AGAIN

THE APRIL TIP about convincing Win 95 to use the U.S. Robotics 33.6-kbps Sportster Voice modem at its maximum speed works only for standard 33.6-kbps Sportsters. The Sportster Voice installation file is mdmusrvi.inf, found at www.usr.com/home/software/dl07.htm. For a complete Sportster Voice installation guide, retrieve document 14113 ("Sportster Voice Installation Under Windows 95") from USR's mail server; send a blank message with the document number in the subject line to support@usr.com. Thanks to Gerard E. Siebert of Herrin, Illinois, for the pointer to the document. I apologize for the error.

STEPPING UP TO .BAT

IN THE MAY *Answer Line* ("The Best Way to Launch Any Executable File"), I incorrectly stated that entering the command 'pkzip' would launch pkzip.bat before pkzip.exe if both were present in the current directory. In truth, the order of execution for executables when you don't specify the file extension is .com, .exe, and lastly .bat. In any case, be careful when you create batch files in the same directory as a .exe or .com file of the same name. To be sure you're running the right executable, type the entire file name. Sorry for the error.

Find additional tips at www.pcworld.com/hereshow. Answer Line *welcomes your questions and tips and pays $50 for published items. Contributing Editor Scott Spanbauer is author of* The No B.S. Guide to Windows 95 *(No Starch Press, 1996, 800/420-7240). See page 14 for contact information.* ■

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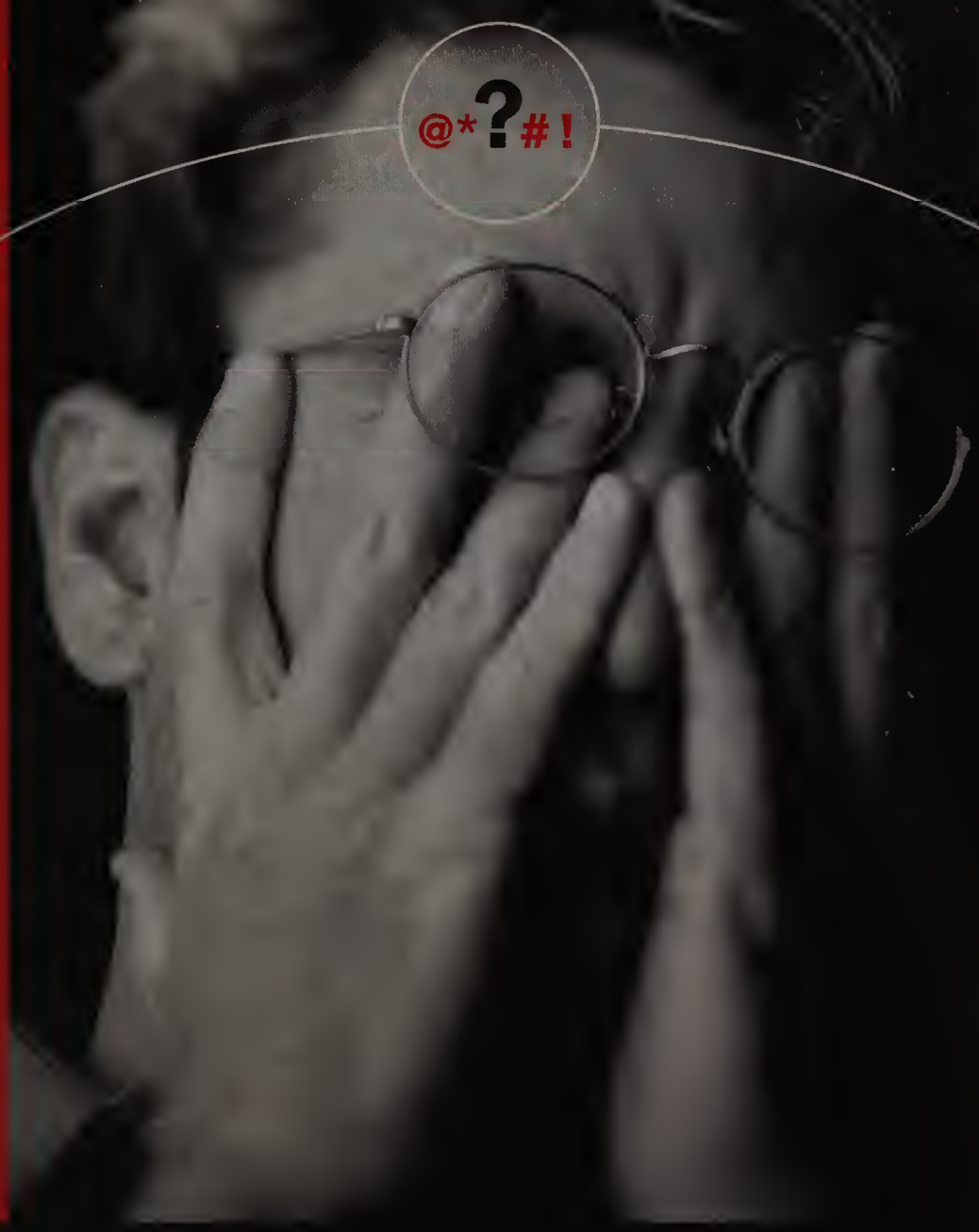

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New and Improved Undocumented Tips

95 THE MARCH COVER story ("Undocumented Secrets: 101 Tips for Windows 95, NT, and 3.x") elicited some questions and improvements from our ever-resourceful readers.

Easier moves to floppies. You can indeed add a batch file to the Send To menu so you can move a file to a floppy disk rather than simply copying it. But Brett Stallman of Spring Hill, Kansas, points out a way to do this without writing a batch file: Right-click the file name, then hold down **<Shift>** as you choose *Send To•3 Floppy (A)*.

If you added a new destination to your Send To menu (by creating a Shortcut to a folder in the Windows\SendTo folder), any file from the same drive you try to send to that location via the Send To menu will get moved, not copied. In that case, you can force the Send To menu to copy (not move) by right-clicking the object and holding down **<Ctrl>** while you choose the destination from the Send To menu.

Instant wallpaper. To make a prettier desktop, you can simply convert a picture into a .bmp file and use it as wallpaper. But just how to convert a picture file to the BMP format baffled Don A. Varney of Chambersburg, Pennsylvania.

The answer: Use a utility specially designed to convert any graphics file to BMP format. You'll find many such inexpensive utilities online. My favorite is PolyView, at www.kagi.com/authors/polybytes/default.html, or available from PC World Online.

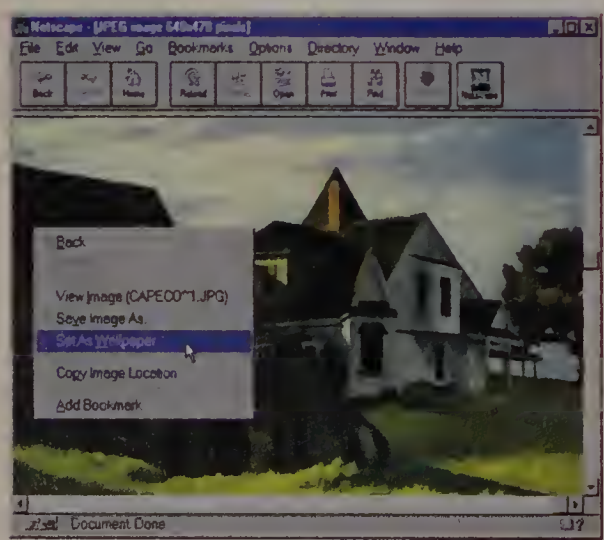

FIGURE 1: NEW WALLPAPER is just a couple of clicks away from your Web browser.

To use the picture as wallpaper, select *Start•Settings•Control Panel*, double-click the *Display* icon, and make sure the *Background* tab is selected. To find your picture, click the *Browse* button. Double-click the file name, select the *Tile* or *Center* button, then click *OK*.

Not fast enough? Try this: If you find a nice image while surfing the Internet with Netscape Navigator 3.*x* or Microsoft Internet Explorer 3.*x*, you can change your wallpaper instantly without first saving the file. With the image displayed in your browser, right-click the image and choose *Set As Wallpaper*, as in **FIGURE 1**. The new wallpaper will be either centered or tiled, depending on this setting in the Control Panel's Display Properties sheet.

Snap to it—or don't. Reader Jim Goss of Lancaster, California, tried arranging his icons and Shortcuts along the edge of his screen for neatness and efficiency, but they stubbornly kept snapping back to where they had been.

If this happens to you, right-click on the desktop and choose *Arrange Icons*. If you see a check mark next to *Auto Arrange*, you've found the culprit. This feature provides a handy way to keep things neatly arranged and works best if you don't have too many items on your desktop. For more control, however, turn Auto Arrange off and put your icons where *you* want them—not where Microsoft does.

Update that screen saver for password protection. You may assume that adding password protection to your screen saver will foil nosy coworkers (unless they reboot your computer). Those who don't know the password will not be able to clear the screen saver. But Jeff Labute, writing via the Internet, has discovered that in Windows 95, some password-protected screen savers can easily be circumvented.

If you're using an old Windows 3.*x* screen saver in Windows 95 (such as Starfield Simulation, whose file name is ssstars.scr), all it takes is a simple **<Ctrl>-<Alt>-<Delete>** to display the Close Program dialog box. Select the name of the screen saver (such as *Stars*) and click *End Task* (twice if necessary), and suddenly the screen saver is gone—along with your privacy. The moral of the story: Stick to the screen savers that come with Windows 95 or the Microsoft Plus Pack.

Conceal some of your past. Tip number 68 in the March cover story asserts that you can't use a batch file to delete files of a specified extension from the Documents menu because the menu is constructed from Shortcuts with the .lnk extension residing in the Windows\Recent folder.

Nevertheless, Brian R. Sheffield of Gainesville, Florida, does just that with an easy batch file like the following:

```
del c:\windows\recent\*jpg*.lnk
del c:\windows\recent\*gif*.lnk
```

This example hides the graphics files you've been viewing by deleting .jpg and .gif files from the Documents menu (your path and extension may differ). Just enter lines like the above in Notepad and save them in a file with the **.bat** extension. For top efficiency, right-click your batch file in Windows Explorer and choose *Properties*. Click the *Program* tab, select *Minimized* from the *Run* drop-down list, check *Close on exit*, and click *OK*. Then run the file any time you need to cover your tracks.

For maximum peace of mind, Brian suggests one more step: If you have Microsoft Plus, you can use System Agent to run your batch file automatically so that you never have to give it a second thought. Choose *Start•Programs•Accessories•System Tools•System Agent*. In the System Agent dialog box, choose *Program•Schedule a New Program*. In the Program box of the resulting dialog box, type in the path to the Shortcut you created when you set properties for your batch file (or click ▶

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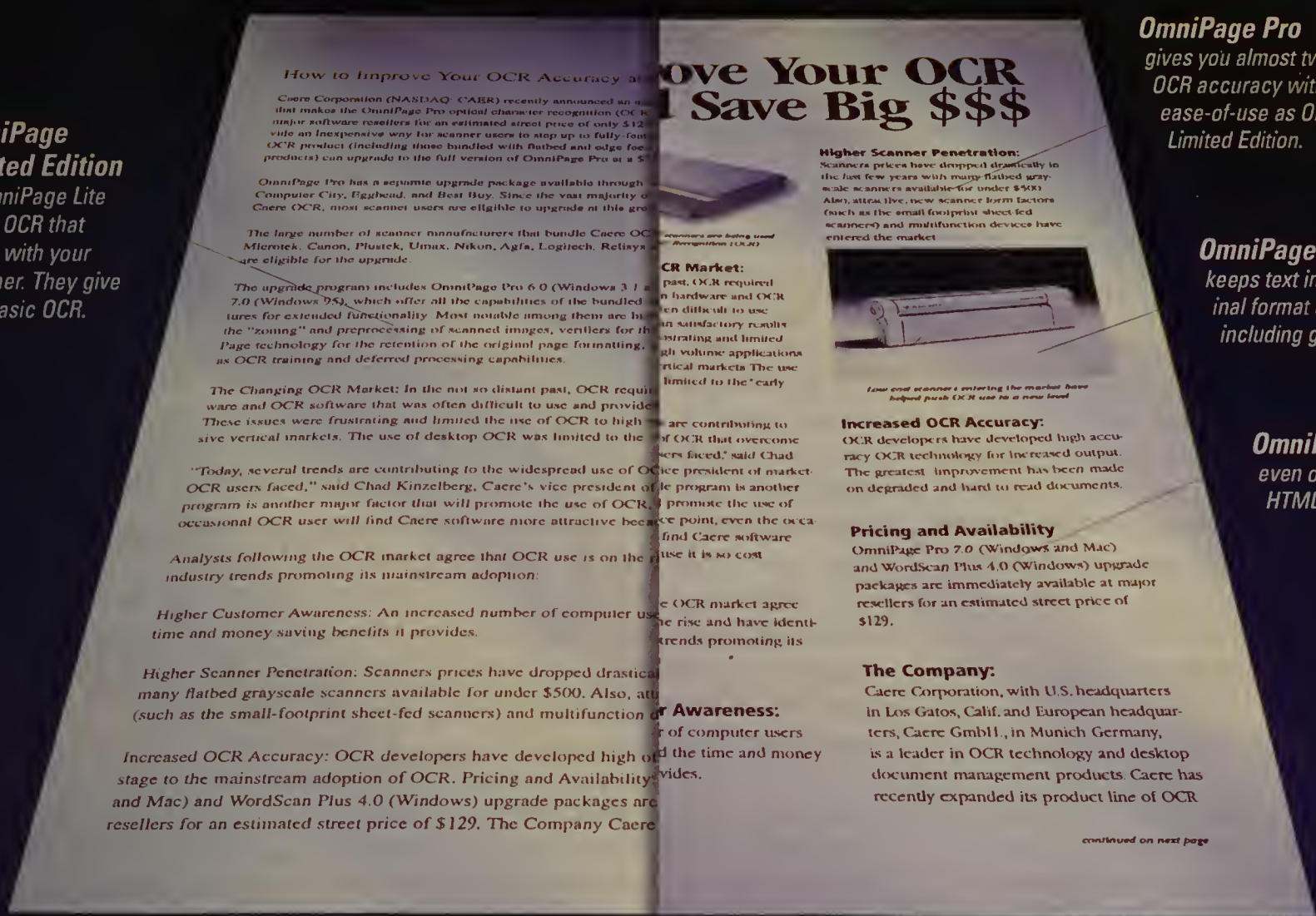

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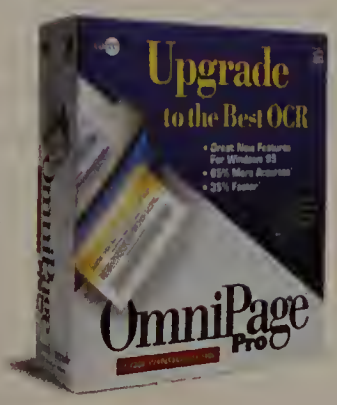

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Browse, locate and select the file, and click *Open*). Click *When To Run*, and set the interval of your choice—for example, *Hourly* for the extra paranoid. Then click *OK* and close System Agent.

Conceal your entire past more quickly. To clear all the files from the Documents menu, you could right-click a blank area on the Taskbar, select *Properties*, click the *Start Menu Programs* tab, click *Clear*, and then click *OK*. Or you could save yourself a few clicks by using the following one-line batch file submitted by Corvus Elrod of St. Paul:

echo Y | del c:\windows\recent*.*

Just enter this line (your path may differ) in Notepad, and save it with the **.bat** extension. (Naturally, you can also add the bells and whistles described in the previous tip.) Run this batch file from a Shortcut on the Start menu, or (if you have Microsoft Plus) automate it with System Agent as described above.

A final tip: If you don't have Microsoft Plus, don't worry: You can still make this or any other batch file run automatically every time you start your computer by simply copying its lines and pasting them to the end of your autoexec.bat file in the root directory of your start-up disk.

SAVE SCREEN SAVE FROM EXCEL'S AUTOSAVE

IF YOU USE Excel's AutoSave feature—that handy option that saves your worksheet at a designated interval—you may have been surprised to return from lunch and notice that Windows' screen saver never started. What gives? The answer is, this feature prevents Windows' screen saver from kicking in as long as Excel is the active window. You can always disable Excel's AutoSave function by choosing *Tools•AutoSave*, unchecking the *Automatic Save Every* box, and clicking *OK*.

But a better solution is simply to switch to a different application before you leave your desk by clicking its icon on the desktop or by pressing **<Alt>-<Tab>**. The screen saver will then engage as usual.

If this seems inconvenient, however, you can always shell out some additional bucks for a different screen saver.

PUT WIN.INI ON A DIET

RARE IS THE Windows 3.*x* user who never, ever has to futz with the file called win.ini. This text file, located in the Windows directory, is the site of several important system and application settings. And although you can often modify its settings (usually without realizing it) by using the Control Panel or other dialog boxes, sooner or later you find yourself editing win.ini directly. One important reason to do so is to keep the file's size in check. Windows won't tolerate win.ini getting larger than 65,536 bytes. But Windows starts acting strangely even before you reach that magic number. As you get closer to the limit, applications may report that they're unable to write to win.ini, or you may receive out-of-memory error messages and even general protection faults.

Don't wait for that to happen. Follow these tips for keeping win.ini fit and trim:

1. Make a backup copy. Choose *File•Run* in either Program Manager or File Manager, type **win.ini**, and press **<Enter>**. If win.ini already exceeds 45K, you may be unable to edit it in Windows Notepad. The System Configuration Editor is even less tolerant, choking on files of about 30K. If this happens, open win.ini in a word processing program capable of saving in text-only format. Save the file with a name like **win.old**. Once you've made this backup, reopen win.ini in your text editor and prepare to make some serious changes.

2. Remove the relics. Like most .ini files, win.ini is divided into sections, each of which begins with a bracketed heading. Read each heading to find software you no longer use. Older shareware is notorious for adding sections to win.ini. If you find a defunct section, delete the heading and every line underneath down to the next bracketed heading. You can also delete the sections for Windows accessories that you don't use—for example, [Cardfile], [Paintbrush], [Recorder], [Solitaire], and [Terminal]. Finally, check the [embedding] section for lines referring to applications you've removed from your system, and delete the outdated lines.

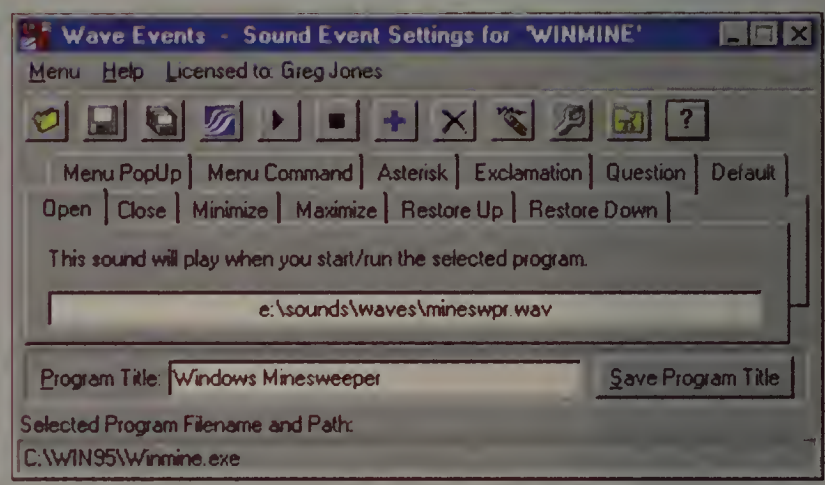
3. Delete the dupes. While you're browsing through win.ini, make a note of any duplicate lines or sections. Then eliminate any redundancies. Windows uses only the first instance it finds, anyway. If you're not sure about deleting a line, disable it by typing a semicolon at the beginning of the line. Save the file and restart Windows. If Windows and your applications function properly over the next few days or weeks, you know you can do without that line.

4. Extract extensions. The [Extensions] section lists your files' three-letter extensions and the program associated with each. In the old days, these lines allowed you to double-click a file in File Manager (or other file management software) and automatically open it in the proper application. Since the advent of Windows 3.1, however, most of this information has been stored in the Registration Database—the redundant win.ini entries remain only to ensure compatibility with older software. To see if a file extension is listed in both locations, do this: Make a note of a file extension you find in win.ini's [Extensions] section. Switch to File Manager, select a file with that extension, and choose *File•Associate*. Make a note ▶

WINDOWS TOOLBOX

Sound Effects for Win 95 Programs

IS WINDOWS 95 too quiet for you? Jazz it up a little by customizing sounds for individual applications. It's easy with the $10 shareware utility Wave Events from Gregory Jones. Wave Events is available on PC World Online.



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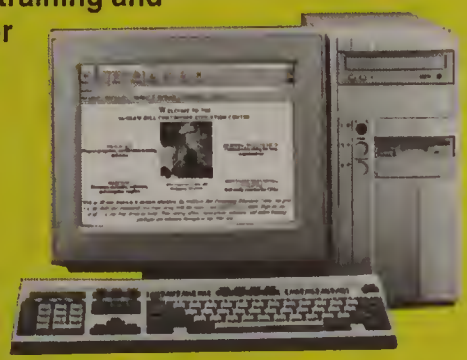

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Take My Documents—Please!

HOW DO YOU permanently delete the My Documents folder?

Debra Palaima, Santa Ynez, California

YOUR PITHY QUESTION refers to a folder Microsoft Office creates for storing files saved with Office applications. It's Microsoft's way of helping you organize your work and preventing you from storing work in application folders, a shockingly common practice that has caused some users to destroy their work accidentally when they upgrade or uninstall the application.

But if you already have your own system of folders for storing work, you might resent Microsoft's forcing the My Documents folder on you—along with the dire warning about Windows needing the folder to run properly.

Fortunately, there's a simple solution. If you already have a folder for storing your work (say, for example c:\work), you can simply move all the contents of that folder into My Documents, delete your old Work folder, and then rename My Documents as **Work**. You can also move My Documents anywhere you like without causing problems; Windows will keep track of its new location.

of its description in the Associate With list. Then click *Cancel*. Choose *File•Run*, type **regedit**, and press **<Enter>** to launch the Registration Info Editor. If you see that same description in this window, File Manager doesn't need the related line in win.ini. Type a semicolon at the beginning of the line to disable it until you're sure you no longer need it.

5. Purge printers. Open the Control Panel and double-click the *Printers* icon. Check the Installed Printers list for those items you no longer need—for example, that old network printer that IS sold off months ago. Select each outdated item and click *Remove* (see **FIGURE 2**).

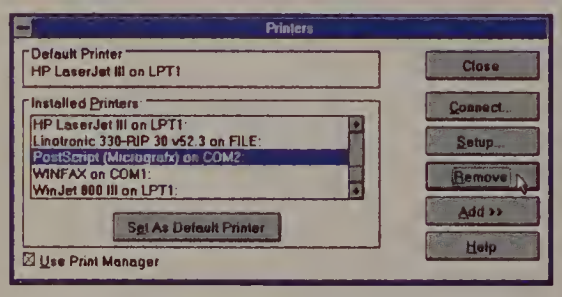

FIGURE 2: REMOVE PREHISTORIC PRINTERS from your Control Panel to relieve win.ini bloat.

6. Silence sounds. While you're in Control Panel, double-click the *Sound* icon. Look for sound Events for software you've removed or Events you don't want. (Do you really need to hear America Online's welcome?) You can't remove the items here, but once you've identified them, you can delete the corresponding lines under the [Sounds] heading in win.ini.

7. Fix fonts. If you use Adobe fonts with a PostScript printer, chances are a good chunk of win.ini is taken up with information about where these fonts reside so they can be downloaded to the printer as needed. Each font requires its own path line in win.ini, and if you want the font to be sent to the printer automatically (rather than using a font downloader), that line will be twice as long—one path for the outline file, one for the font metrics file. For font lovers, win.ini bloat is inevitable.

One solution is to live with fewer fonts. But if you have Adobe Type Manager, a better solution is to use its control panel to remove (but not delete) fonts (see **FIGURE 3**). This action takes fonts out of win.ini but leaves them on your hard drive, where you can easily use ATM to add them back later. With version 2.5 or later, you can perform these operations without restarting Windows. Unfortu-

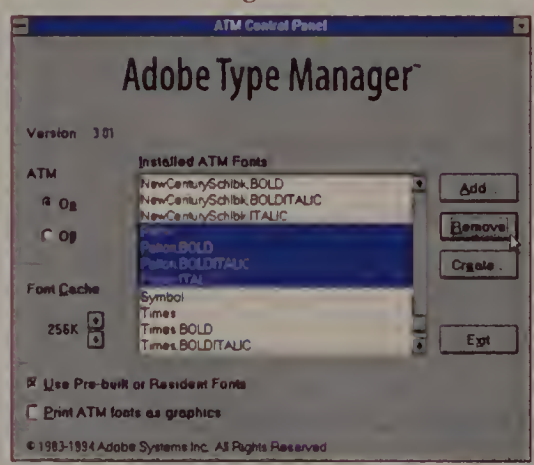

FIGURE 3: SHRINK WIN.INI by removing font path lines with Adobe Type Manager.

nately, having to select individual fonts for adding or removing can be cumbersome.

Another solution is to ditch the PostScript driver that comes with Windows and download the Adobe PostScript driver from www.adobe.com. This driver doesn't require font references in your win.ini file. Note: You may need to remove the old PostScript driver completely.

QUICK VIRUS SCANNING WITH NORTON ANTIVIRUS

SOME ANTIVIRUS utilities, such as McAfee VirusScan 95, add a command to your right-mouse menu so that you can right-click a drive, folder, or program file and scan it for viruses without first launching the application. Norton AntiVirus doesn't do this, but Daniel Wilson of Milwaukee points out an easy way to give Norton this ability. Simply locate the Shortcut for Norton AntiVirus in the appropriate folder in your \Windows\Start Menu\Programs folder (your path may differ). Select the

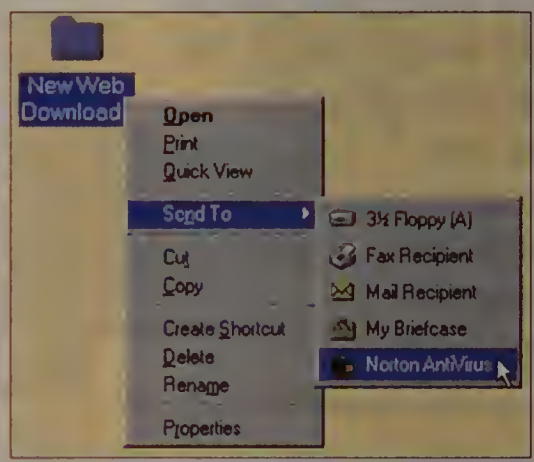

FIGURE 4: CHECK ANY FILE for infection by adding a virus scanner to the Send To menu.

Shortcut and choose *Edit•Copy*. Then navigate to the \Windows\SendTo folder and choose *Edit•Paste* or *Edit•Paste Shortcut*. Now any time you need to scan a file or folder for viruses, just right-click its icon and choose *Send To•Norton AntiVirus*, as in **FIGURE 4**. The program will run almost invisibly (you'll see a button on the Taskbar), then close when it's done, assuming all is well. If it finds a virus, it will display a warning.

You can use this tip with any virus-scanning software that supports file names on the command line.

Find files from this article at www.pcworld.com/files and additional tips at www.pcworld.com/hereshow.html. Windows Tips *welcomes your tips and questions and pays $50 for published items.* PC World *contributing editor Scott Dunn is a principal author of the* PC Bible, 2nd Edition *(Peachpit Press, 1995, 800/283-9444). See page 14 for contact information.* ■

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Copying Formulas: Gotcha!

I'M TRYING TO COPY a formula from one sheet to another in Excel, using the Edit•Copy and Edit•Paste commands. But when I do this, I get #REF instead of a number. What am I doing wrong?

R. T. Roark, Sacramento, California

THE PROBLEM YOU describe occurs in any spreadsheet because the copy you've made refers to an impossible cell address.

Let's say that cell A11 contains a formula that adds up numbers above it: =sum(A1:A10). You copy the formula and paste it into cell A21, and the new formula correctly reads =sum(A11:A20). The cell references have shifted so that they stay relative to the new formula's location. But if you copy the formula into A5, the result is #REF, because the new formula refers to cells located off the top of the sheet.

To fix your workbook, double-check those formulas and adjust the layout of your data. Good luck!

FROM QUICKEN TO SPREADSHEET

IN MY WORK as treasurer for a recently successful congressional campaign, I kept track of contributions using Quicken 5. Now I want to bring the raw transaction data into a spreadsheet database to do some queries and what-if analyses. What's the easiest way to do this?

Mark Russell, Internet

YOU CAN DO IT with any Quicken transaction. Here's how: From Quicken 5's Home Base menu, select *Reports*, click the *Other* tab, select *Transaction*, and click *Customize*. Specify the Start and End dates for the transactions you want to transfer, select *Split Transaction Detail*, and in the Show Columns list select the columns you want. Click *Create* and review the report on screen. Now select *File•Print Report*, select *Tab-Delimited Disk File*, and click *OK*. In the dialog box, specify a file name and click *OK*.

Open the resulting text file in your spreadsheet (I'm using 1-2-3), specifying *Tab-Delimited* as the column delimiter. Delete the blank rows, and you'll wind up with something that looks like **FIGURE 1**.

The data's all there, but columns A through D are missing some cell entries you'll need for your database operations. For example, instead of repeating the date 08/03/97 in A3..A9, 1-2-3 leaves the cells blank. You can, of course, infer that the dates for rows 3 through 9 are the same as the date in cell A2. However, when you sort the data for querying and what-if analyses, all these blank cells will appear at the beginning or end of the column.

	A	B	C	D	E	F	G
1	Date	Account	Num	DescriptioMemo		Category	Amount
2	08/03/97	UMB Main	DEP S	Deposit	10248	Contrib	500
3					10396	Contrib	1000
4					10397	Contrib	1000
5					10353	Contrib	500
6					1107	Contrib	25
7					549	Contrib	25
8					5930	Contrib	25
9					10396	Contrib	1000
10	08/08/97	UMB Main	TM2000	Deposit	10395	Contrib	1000
11					10054	Contrib	1000
12					10101	Contrib	1000
13	08/15/97	UMB Main	DEP S	Deposit	10397	Contrib	1000
14					10398	Contrib	1000

FIGURE 1: WHEN YOU IMPORT DATA into 1-2-3, repeating values may appear blank.

To fill the blank cells with their correct entries, enter **+A2** in cell I2 (in Excel, enter **=A2**) and copy it to J2..L2. This formula copies the first row of data to a temporary area in the worksheet. In cell I3, enter the formula **@if(@cell("type",A3)="b",I2,A3)** and copy it to I2..L14. (In Excel, enter **=if(isblank(A3),I2,A3)** and copy it to I2..L14.) This formula tests whether the current cell is blank. If it is, 1-2-3 returns the entry in the cell above.

Finally, select I2..L14 and select *Edit•Copy*. Select A2, choose *Edit•Paste Special*, select *Formulas as Values* in the dialog box, and click *OK*. Now delete columns I through L. Your database (shown in **FIGURE 2**) is ready for sorting or querying.

	A	B	C	D	E	F	G
1	Date	Account	Num	DescriptioMemo		Category	Amount
2	08/03/97	UMB Main	DEP S	Deposit	10248	Contrib	500
3	08/03/97	UMB Main	DEP S	Deposit	10396	Contrib	1000
4	08/03/97	UMB Main	DEP S	Deposit	10397	Contrib	1000
5	08/03/97	UMB Main	DEP S	Deposit	10353	Contrib	500
6	08/03/97	UMB Main	DEP S	Deposit	1107	Contrib	25
7	08/03/97	UMB Main	DEP S	Deposit	549	Contrib	25
8	08/03/97	UMB Main	DEP S	Deposit	5930	Contrib	25
9	08/03/97	UMB Main	DEP S	Deposit	10396	Contrib	1000
10	08/08/97	UMB Main	TM2000	Deposit	10395	Contrib	1000
11	08/08/97	UMB Main	TM2000	Deposit	10054	Contrib	1000
12	08/08/97	UMB Main	TM2000	Deposit	10101	Contrib	1000
13	08/15/97	UMB Main	DEP S	Deposit	10397	Contrib	1000
14	08/15/97	UMB Main	DEP S	Deposit	10398	Contrib	1000

FIGURE 2: A FEW FORMULAS fill in the blanks so that you can sort the data and perform queries.

TURN YOUR WORKSHEET SIDEWAYS IN 1-2-3

SUPPOSE YOU HAVE a 1-2-3 worksheet laid out like the one shown in the top of **FIGURE 3**. Column E contains formulas like @sum(B2..D2), and row 6 contains formulas such as @sum(B2..B5). Now suppose your boss wants the worksheet turned sideways, with the row headings displayed across the top and the column headings down the side, as shown in the bottom of Figure 3.

The Range•Transpose command may seem like a good place to start. If you use it, though, you'll find that it converts all the formulas into numbers.

Here's the correct way to turn the table: In cell A10, enter the formula **@@(@coord (1,@cell("row",A1..A1),@cell("col",A1..A1),8))** and copy it into range A10..F14. You'll end up with a pivoted image of the original table that changes when you update values in the original.

The formula uses 1-2-3's @cell functions to retrieve the row and column numbers of the referenced cell. The @coord function converts those numbers into a cell address; I've used the row number where @coord expects to see a column number, and vice versa. Note that the first argument of the @coord function, 1, refers to sheet A; to use it on another worksheet, adjust the number accordingly. Finally, the @@ function creates a reference to the cell address produced by the @coord function.

	A	B	C	D	E
1	ITEM	JAN	FEB	MAR	SUM
2	Flights	234	345	123	702
3	Training	345	456	234	1035
4	Concessions	465	567	987	2019
5	Sales	567	678	98	1343
6	SUM	1611	2046	1442	5099

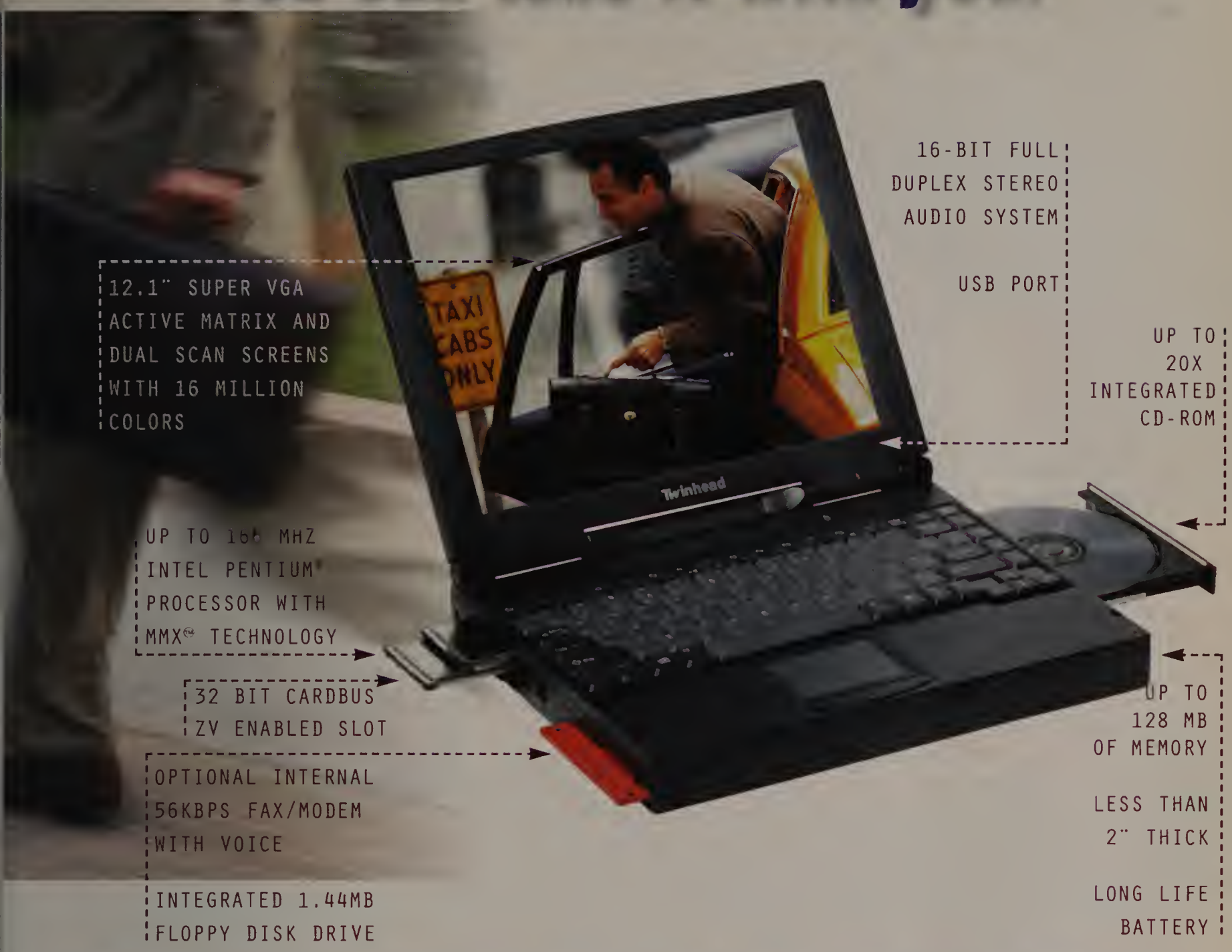
	A	B	C	D	E	F
10	ITEM	Flights	Training	Concession	Sales	SUM
11	JAN	234	345	465	667	1611
12	FEB	345	456	567	678	2046
13	MAR	123	234	987	98	1442
14	SUM	702	1035	2019	1343	5099

FIGURE 3: TURN A 1-2-3 WORKSHEET on its side using a formula, not Range•Transpose.

Obvious? No. Handy? Yes!

Spreadsheets welcomes your questions and tips and pays $50 for published items. Contributing Editor Richard Scoville is a software training consultant in Chapel Hill, North Carolina. See page 14 for contact information. ■

You can take it with you.



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Circle 240 on reader service card

Corel upgrade for DOS users ◆ Word's Spike feature ◆ Custom SmartFills in Word Pro

Adding Page Borders in Word 97

UNTIL NOW, THERE was no simple way to create a border around a page. Finally, Microsoft makes it easy in Word 97 to embellish title pages, certificates, and flyers with borders—but many veteran Word users won't notice this new tool.

Here's how to apply a page border (also see **STEP BY STEP**):

1. Select *Format•Borders and Shading*, then click the *Page Border* tab in the Borders and Shading dialog box.
2. Select a type of border by clicking one of the Setting icons. Each selection you make is reflected in the Preview window on the right side of the dialog box.
3. If you want a simple line border, scroll through the Style list to find a line that suits your document. Notice that some graphical styles appear near the bottom of the list, so be sure to view the entire list before selecting a style. Check the Preview window to see how your selection looks.
4. If you want the border lines to be in a color other than black, select a color from the *Color* drop-down list. Leave the setting on Auto if you want black.
5. For most line styles, you can choose a line width ranging from thin to thick, to further customize your border. Select from the *Width* drop-down list.
6. To get a more fanciful border, click the *Art* drop-down list and choose from dozens of images such as trees, flowers, hearts, and stars. You can control the size of the repeated images by selecting from the *Width* list.
7. Once you're satisfied with your border, click the *Apply to* drop-down list and select where you want the border to appear. For simple, one-page documents, choose *Whole Document;* to place a border just on the first page of the document, choose *This section – First page only.*
8. Word automatically fits your border to the page, as close to the outside of the printable area on the page as possible. This is normally a good default, but you can change margin settings if you wish by clicking the *Options* button.
9. Finally, click *OK* to complete the process. If you need to change any of the settings, simply return to the page that has the border and select *Format•Borders and Shading* again.

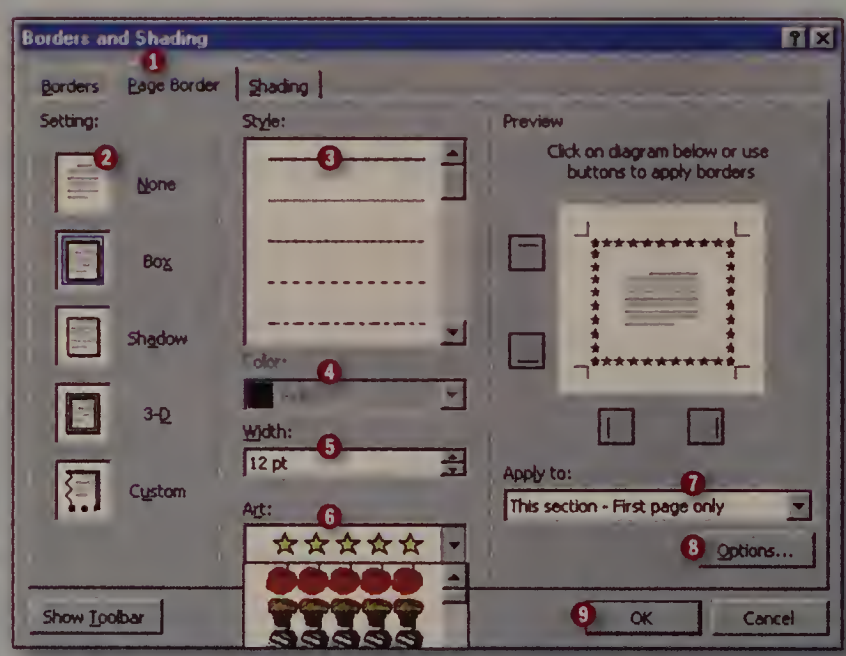
ATTENTION DOS USERS: NEW COREL WORDPERFECT SUITE IS HERE

SINCE WINDOWS crashed onto the scene, users who are stuck with DOS-based PCs have been ignored by most software publishers. Corel, however, has just released a brand-new product that brings the power of its office suite to DOS users. Corel WordPerfect Suite for DOS offers WordPerfect 6.2 for DOS, Quattro Pro 5.6 for DOS, Corel Presentations 2.1 for DOS, Corel Shell 4.0c, plus a large collection of clip art, fonts, and even a copy of WordPerfect 6.1 for Windows 3.1, all on floppy disks and a CD-ROM.

The new version of WordPerfect will be familiar to users of previous 6.*x* versions for DOS, but Corel has added QuickCorrect (which fixes typos while you type), a Make it Fit feature, and dozens of document templates. As with earlier 6.*x* versions, you get a WYSIWYG screen for editing—a real plus over version 5.1, although you can drop back to a text-based editing mode for speed. ▶

STEP BY STEP

Embellish Word 97 Documents With Simple or Fanciful Borders



1. Select *Format•Borders and Shading*, then click the *Page Border* tab.
2. Click one of the Setting icons to select a border type.
3. Select a line from the Style list if you want a simple border.
4. For some color, select a shade from the *Color* drop-down list.
5. Select a line width from the *Width* drop-down list.
6. For a border with images instead of lines, click the *Art* drop-down list.
7. Click the *Apply to* drop-down list to select the position of the border.
8. Click *Options* if you want to adjust the position.
9. Click *OK* to finish.

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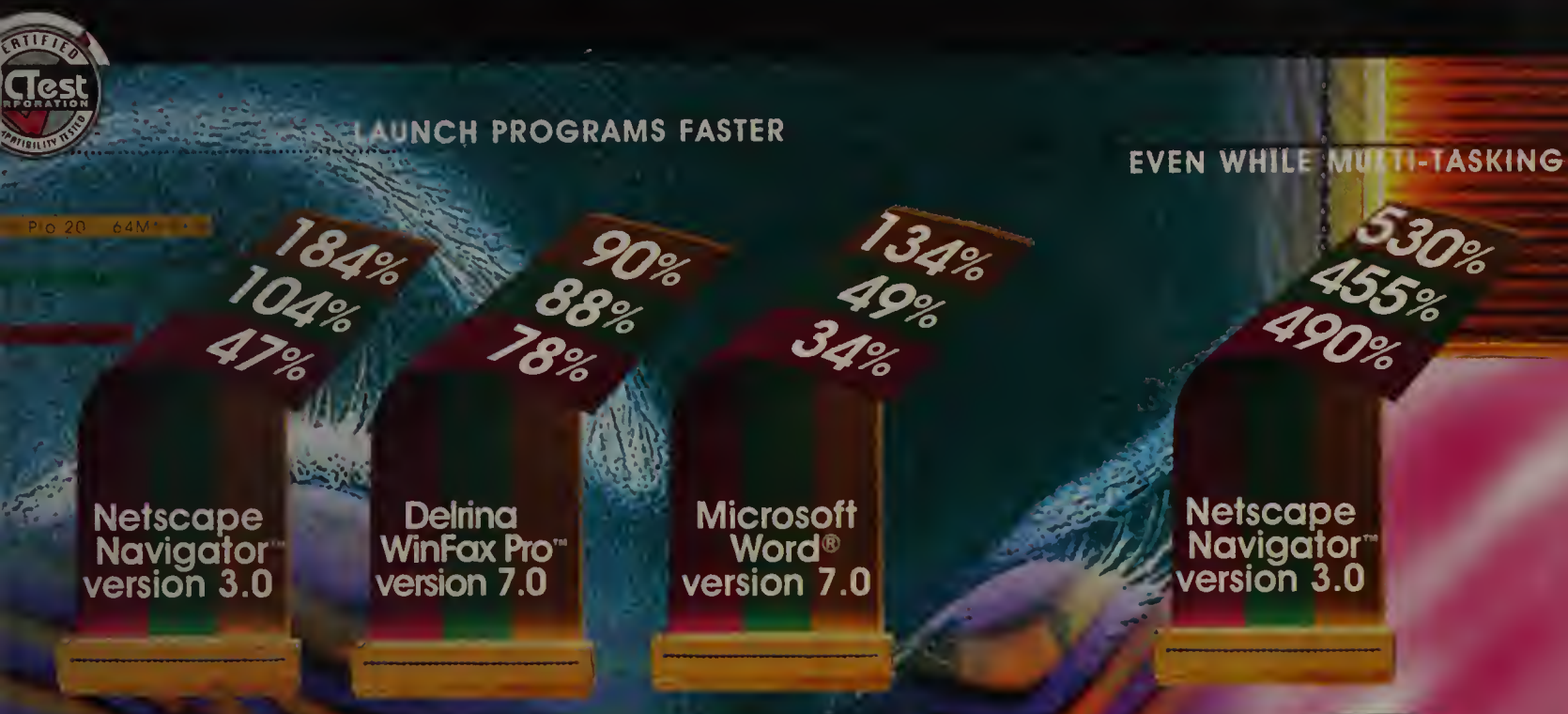

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Here are the numbers

And they speak for themselves. PCTest measured how much faster you can launch these applications, even while multi-tasking (four intense, concurrent disk access processes). *While results may vary based on your system, applications and nature of multi-tasking, we think you'll be impressed.

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Circle 232 on reader service card

The other applications in the suite also get new features and enhancements. If you're using DOS, this is the only new game in town, and it's worth the upgrade.

To run the Corel WordPerfect Suite for DOS, you'll need at least a 386 PC, with 520K of free conventional memory and a 20MB hard disk.

• Corel WordPerfect Suite for DOS $395 list, upgrade $129; Corel Corp.; 800/772-6735, 613/761-9176 (fax); www.corel.com

READER SERVICE NO. 607

COLLECT AND MOVE WITH WORD'S SPIKE

HAVE YOU EVER had to collect blocks of text and graphical images from different places in one or more Word documents, then insert them into another document?

This sounds like a multistep process, but if you're working in Word 6.0 or a later version, you can simplify the job by using the Spike. The Spike, named after the old-fashioned editor's spindle, is part of Word's AutoText feature, which lets you store text for repeated use. You add text and graphics to the Spike one by one, then insert them into another document as a group. Here's how:

1. Open the document, or documents, containing the text or graphics that you want to collect.
2. Select the first item you want to send to the Spike. Keep in mind that items in the Spike are inserted in the final document in the order in which they were added.
3. Adding an item to the Spike removes it from the original document, so if you need to keep the original intact, press **<Ctrl>-C** to copy the item to the Windows Clipboard.
4. Press **<Ctrl>-<F3>** to move the first item to the Spike.
5. Press **<Ctrl>-V** to reinsert the item in the originating document if necessary.
6. Repeat the steps above until you've collected all the material you want to transfer.
7. To insert all your collected material and clear the Spike's contents, position the cursor on a blank line in the document where you want the items to go, then press **<Ctrl>-<Shift>-<F3>**. To insert the contents of the Spike without clearing it, so that you can use the items again later, position the cursor where you want to insert the Spike material, type **spike**, then press **<F3>**.

Note: Before you begin a new collection of items, make sure the Spike is empty. To view its contents, to insert a new item, or to delete an item, select *Edit•AutoText* (*Insert•AutoText•AutoText* in Word 97), then choose *Spike* from the list of AutoText entries, as in **FIGURE 1**.

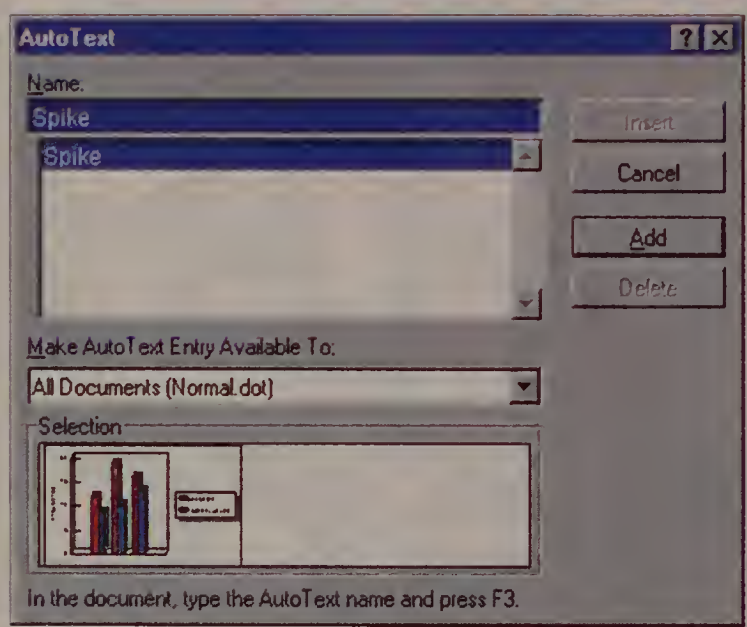


FIGURE 1: WORD'S SPIKE FEATURE lets you gather chunks of text or graphics from several files, then move them to a new file.

CREATE CUSTOM SMARTFILL LISTS IN WORD PRO

SPREADSHEET USERS can fill a worksheet range with a sequence of items—the days of the week, the months of the year, or product ID codes, for example—by entering just the first item in the sequence. Users of all versions of Lotus Word Pro can do the same in their tables, thanks to the terrific SmartFill feature.

For example, you can type **Monday** in a table cell, then hold down the **<Ctrl>** key while you click and drag down or across other cells. When you release the mouse button, Word Pro automatically fills in the rest of the days of the week.

Word Pro comes with several standard SmartFill lists like the above, but you can easily create your own lists of items you commonly keep tabs on. For example, you might want to create a custom list of the employees in your department, the students in your class, or all the branch offices in your company.

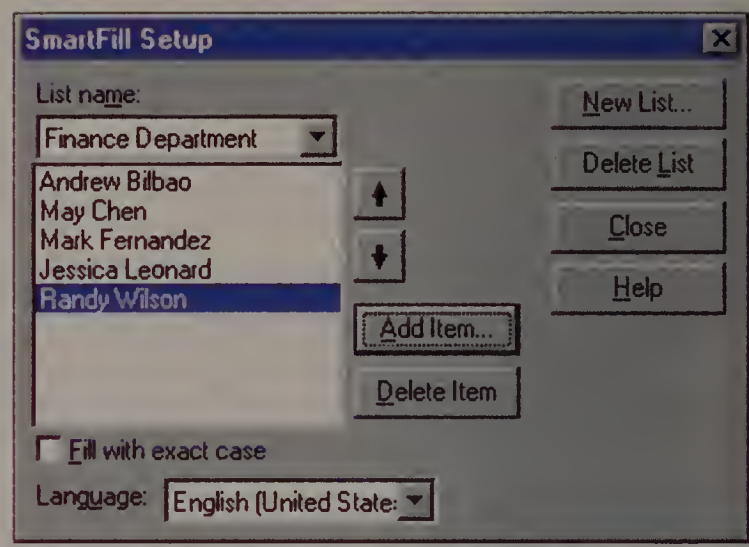
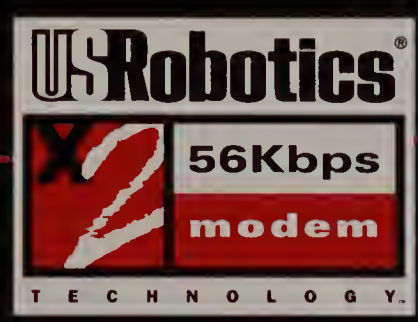


FIGURE 2: CREATE A WORD PRO CUSTOM SMARTFILL to speed entry of sequential items in a table.

Follow the steps below to create your own SmartFill lists in Word Pro 96 and Word Pro 97:

1. From the main menu, select *File•User Setup•SmartFill Setup.*
2. In the SmartFill Setup dialog box, click *New List.*
3. In the New SmartFill List dialog box, type a name for your new list, and then click *OK.*
4. Back in the SmartFill Setup dialog box, click *Add Item.*
5. In the New SmartFill Item dialog box, enter the items in your new list.
6. Repeat steps 4 and 5 until you've entered all the items in your new list (see **FIGURE 2**). To save time, enter the items in the order you'll normally want them to appear in your tables.
7. Check the order of the items in the list. To move an item, click it, then click the up or down arrow button to reposition it within the list.
8. Finally, click *Close* to finish the job and save your list.

Word Processing *welcomes your questions and tips and pays $50 for published items. Contributing Editor George Campbell is a contributor to* The PC Bible *(Peachpit Press, 1995, 800/283-9444). See page 14 for contact information.* ■



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Buy any Sportster,® Courier™ or Megahertz® 56K modem with x2™ Technology between June 1 and September 15, 1997 and get one month of Internet service plus upgrade to 56K ITU-T standard,[1] FREE. And if you're not satisfied after 30 days you can return the modem for a full refund.

To get your free month of Internet service with an x2-capable Internet service provider, just complete and return the form below.

Then, you'll also be registered for the free upgrade. After the ITU-T standard for 56K modems is approved, we'll upgrade your U.S. Robotics x2 Technology 56K modem, free of charge. Since every x2 modem is equipped with Flash ROM, we expect the upgrade to be as simple as a software download from the Internet. If it's not, we'll replace your modem with one that does meet the new standard – free of charge. Register your modem, and after the 56K standard is approved by the ITU-T, we will notify you how and when to get your free upgrade. Approval is expected some time in early 1998.

And again, if you're not satisfied with your U.S. Robotics x2 Technology 56K modem, simply return it within 30 days of purchase, along with dated receipt, to the store or mail order reseller where you bought it for a full refund.

1 Guaranteed upgrade valid for all currently available Sportster 56K Faxmodems (Models 1783, 1784, 1785, 1786, 1787 and 1789), Courier 56K Faxmodems (Models 1867, 1868 and 1869) and Megahertz 56K PC Card Faxmodems (Models XJ1560, CC1560, XJ5560, CC5560). This offer valid in the U.S. and Canada only.

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3. Fill in all requested information on this form.
4. Enclose this completed form with a copy of your dated modem receipt, original UPC bar code symbol and serial number from the modem package (see samples below) and proof of your x2 ISP monthly fee (credit card bill or monthly statement) and mail to:
   U.S. Robotics, x2 Delivers, PO Box 8061, Young America, MN 55551-8061
   (Any questions regarding this program, please call 1-800-727-2107.)

(Please print all information clearly.)

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Phone _____ **E-mail Address** _____

Retailer / Mail Order where modem purchased _____

ISP Name _____ **Monthly fee** _____

Internet service offer valid with purchase of Sportster 56K Faxmodems models 1783, 1784, 1785, 1786, 1787 and 1789; Courier 56K Faxmodems models 1867, 1868 and 1869 and Megahertz 56K PC Card Faxmodems models XJ1560, CC1560, XJ5560, CC5560 only; purchased between June 1, 1997 and September 15, 1997. Request must include copy of dated modem sales receipt, actual UPC bar code and serial number from the modem package, and proof of x2 ISP monthly fee. One Internet service refund per address. Not responsible for lost, late or misdirected mail. Request must be postmarked by November 15, 1997. Valid in U.S. and Canada only. Not valid with any other offer. Please allow 6 to 8 weeks for receipt of check. Consumer is responsible for payment of monthly fee to service provider.

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7-38168-00682-3	6-62662-52776-1	6-62662-52939-0	6-62662-52778-5
6-62662-52823-2	6-62662-52825-6	7-36168-00686-1	7-36168-00669-4
7-36168-00670-0	7-36168-00687-8		

Tape serial number & bar code over this box.

Fax Reports From Access

IF YOU WANT to fax an Access report, you can print the report, trot over to the fax machine, and send it. Or you can remain seated and fax the report directly from Access. All you need is a fax-modem, the Microsoft Exchange e-mail client, and Microsoft Fax or Symantec's WinFax Pro. In the examples here, we'll use Microsoft Fax. To see how this technique works with either program, download rptsampl.exe from ftp://ftp.microsoft.com/softlib/mslfiles or from PC World Online.

FAX A REPORT TO ONE NUMBER

IF YOU ROUTINELY fax a particular report to one person, you can create a simple macro that records that person's phone number and the name of the report you want to send. Here's how:

1. In the Database window, click the *Macros* tab and then *New*.
2. Choose *SendObject* from the *Action* drop-down list. In the bottom half of the macro builder dialog box, set Object Type to *Report*, set Object Name to the name of the report you want to fax, set Output Format to *Rich Text Format*, and enter **fax: ###-####** after 'To:' where ###-#### is the number you want to fax to.
3. Close the macro and save it as **Fax Report**, or whatever you like.
4. To fax the report, click the *Macros* tab in the Database window, select *Fax Report*, then click the *Run* button.

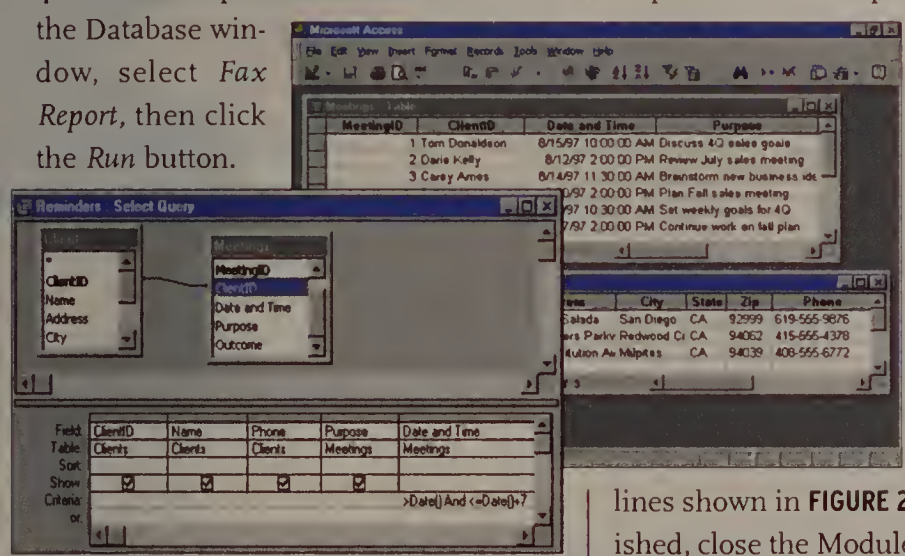


FIGURE 1: THE QUERY selects people from the Meetings table who are scheduled for meetings in the next week. The Meetings table is joined to the addresses in the Clients table.

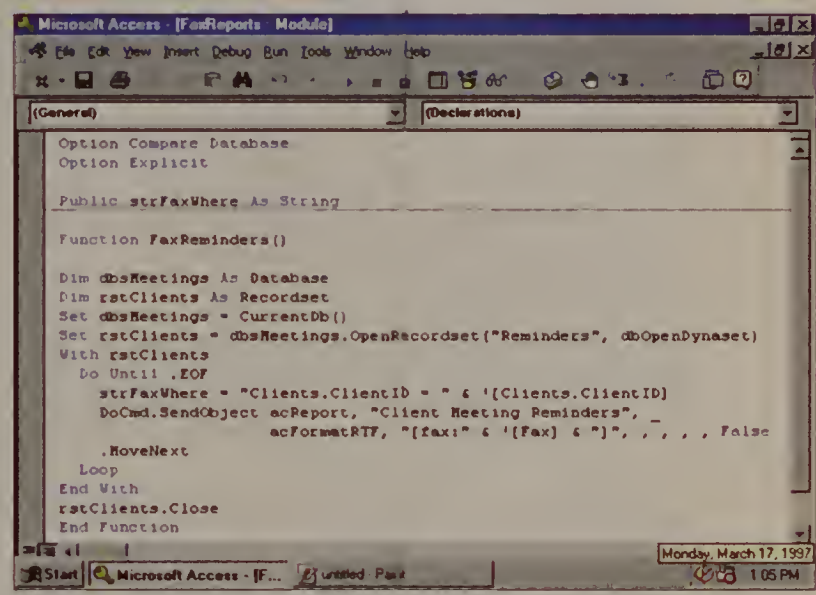
FAX A REPORT TO SEVERAL PEOPLE AT ONCE

A SLIGHTLY MORE complex procedure allows you to send a fax to several different numbers. In the example below, we'll create a report to remind selected individuals of an upcoming meeting. The date and purpose of the meeting will vary with each individual.

1. Create a query to select the people you want to receive the report. The left side of **FIGURE 1** shows a query called 'Reminders' that selects records from a Clients table and a Meetings table (shown on the right).
2. Create a design for the report.
3. With the report in design view, right-click the box in the upper-left corner of the report window and choose *Properties*. Click the *Event* tab, select *[Event Procedure]* from the drop-down menu for *On Open*, and click the ... at the end of the line. Then enter **Me.Filter=strFaxWhere** in the window that opens. Close the code window, close the report, and save it. This step tells Access to print only records in which ClientID is the same as the value stored in the variable strFaxWhere.
4. Click the *Module* tab in the Database window, then click *New*. Under 'Option Explicit', type the lines shown in **FIGURE 2**. When you're finished, close the Module window and save it as **FaxReports**.
5. Create a macro to fax the reports: Click the *Macros* tab in the Database window, then click *New*. Select *RunCode* from the *Action* list, and enter **FaxReminders()** in the Function Name box. Save the macro as **Fax Meeting Reminders**.
6. To fax the reminders, highlight *Fax Meeting Reminders* on the *Macros* tab in the Database window and click *Run*. Choose a profile if you're prompted, and click *OK*.

You'll have to make some changes to the code to make it work with your database:

- In the first 'Dim' statement, replace 'Meetings' (in the expression 'dbsMeetings') with the name of your database.
- Replace the term 'Reminders' with the name of the query your report is based on.
- Replace the term 'Clients.ClientID' with the name of your client code or customer number field.
- Replace 'Client Meeting Reminders' with the name of your report.
- Replace the term 'Fax' in ![Fax] with the name of the field that contains your fax numbers.
- In this example, ClientID is an AutoNumber field. If you're using a text field to select records, change the line under 'Do Until...' to read: **strFaxWhere = "Clients.ClientID = '" & ![Clients.ClientID] & "'"**. Include a space followed by an underscore at the end of any line you break, as in the 'DoCmd.SendObject' line in Figure 2.



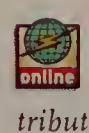
```
Option Compare Database
Option Explicit

Public strFaxWhere As String

Function FaxReminders()

Dim dbsMeetings As Database
Dim rstClients As Recordset
Set dbsMeetings = CurrentDb()
Set rstClients = dbsMeetings.OpenRecordset("Reminders", dbOpenDynaset)
With rstClients
  Do Until .EOF
    strFaxWhere = "Clients.ClientID = " & ![Clients.ClientID]
    DoCmd.SendObject acReport, "Client Meeting Reminders", _
                     acFormatRTF, "[fax:" & ![Fax] & "]", , , , , False
    .MoveNext
  Loop
End With
rstClients.Close
End Function
```

FIGURE 2: THIS MODULE FAXES A REPORT directly from Access to each individual selected in the Reminders query.



Find files from this article at www.pcworld.com/files. PC World *contributing editor Celeste Robinson is coauthor of* Mastering Paradox 7 for Windows 95 *(Sybex, 1996, 800/227-2346).* *See page 14 for contact information.* ■

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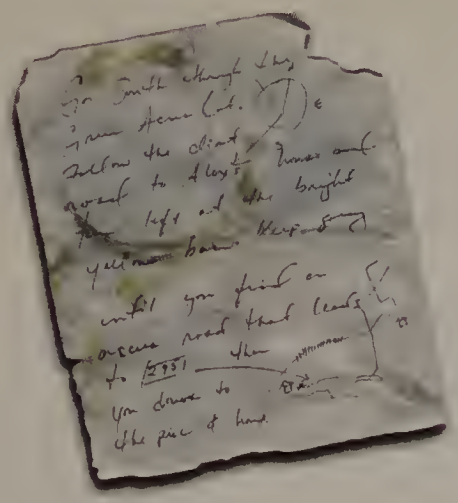

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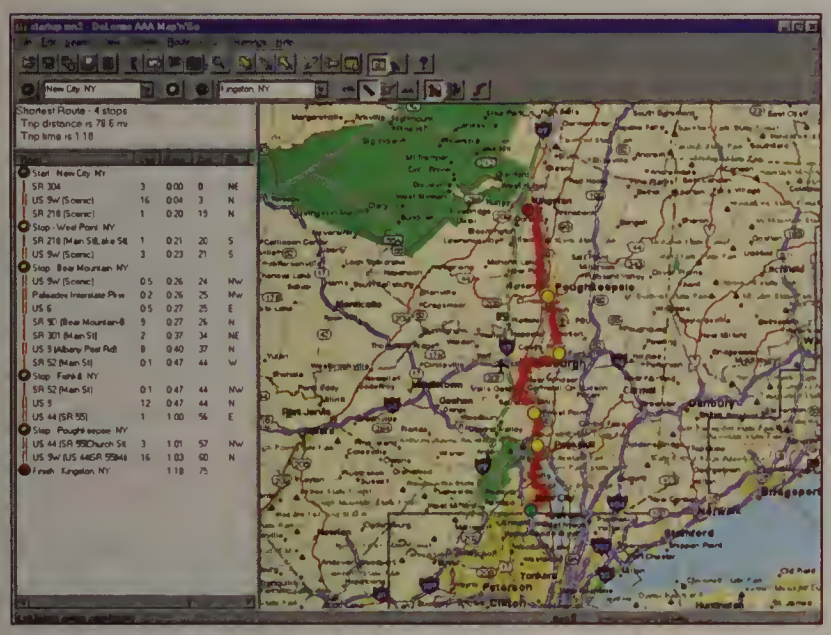

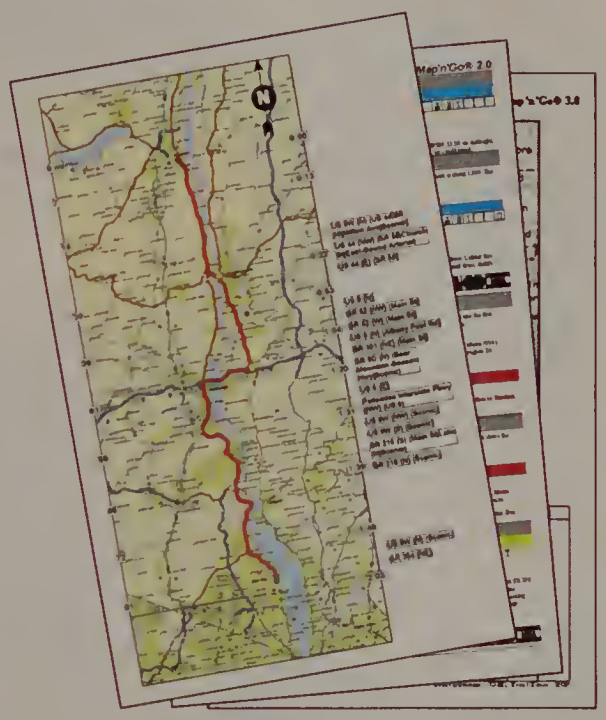

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Teach Your Children Internet Safety

WHILE THE INTERNET is full of wonders for children, it's also fraught with hazards. Friendly strangers may not be who they seem, and many Web sites contain material that's inappropriate for minors.

Fortunately, there are several steps you can take to keep your kids' cyberspace adventures safe.

• **Find out what they're doing online.** Learn how to log on to the online services and sites that your children use. Get to know your kids' online pals, just as you know their real friends.

• **Become familiar with online services' parental controls.** Services such as America Online let you block adult chat areas or real-time requests for chat. Also consider installing Internet screening software like CyberPatrol (www.cyberpatrol.com) or Net Nanny (www.netnanny.com).

• **Bookmark family-friendly links.** Numerous sites offer collections of screened kid-safe sites. Two good ones are EZConnect (www.ezconnect.com) and Virtuocity (www.virtuocity.com/family.html). Look for omnibus sites that screen several "levels" of links—in other words, they also screen their links to other Web sites. KidsCom (www.kidscom.com) offers a game that children can play to learn about Internet safety (see **FIGURE 1**).

• **Establish household rules for computer use.** If your children are using online services excessively, especially late at night, you should limit the times they may use the computer, and place it in a family room if it isn't already there. Also consider requiring your kids to sign a "contract" that outlines the rules for using online services; a sample is available at the National Center for Missing and Exploited Children site (www.missingkids.org) and is printed here (see "My Rules for Online Safety").

My Rules for Online Safety

1. I will not give out personal information such as my address, telephone number, parents' work address or phone number, or the name and location of my school without my parents' permission.
2. I will tell my parents right away if I come across any information that makes me feel uncomfortable.
3. I will never agree to get together with someone I "meet" online without first checking with my parents. If my parents agree to the meeting, I will be sure that it is in a public place and bring my mother or father along.
4. I will never send a person my picture or anything else without first checking with my parents.
5. I will not respond to any messages that are mean or in any way make me feel uncomfortable. It is not my fault if I get a message like that. If I do, I will tell my parents right away so they can contact the online service.
6. I will talk with my parents so that we can set up rules for going online. We will decide upon the time of day I can be online, the length of time I can be online, and appropriate areas for me to visit. I will not access other areas or break these rules without their permission.

Copyright © 1994 National Center for Missing and Exploited Children. All rights reserved.

FIGURE 1: BEFORE YOU LET YOUR CHILDREN WANDER in cyberspace, point them to KidsCom.

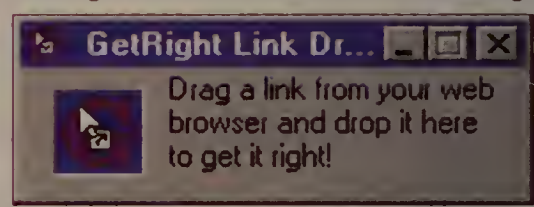
SALVAGE INTERRUPTED DOWNLOADS

YOU KNOW THAT sick feeling. Your PC has been chugging away for nearly an hour downloading a 5MB shareware program off the Internet when someone picks up the phone in another room, or your Internet service suddenly disconnects. Lawrence Goetz of Brooklyn writes that in some instances you can resume the interrupted download by leaving your browser window untouched and reconnecting to the Internet. The download should then automatically pick up where it left off.

Why is this? It's because both HTTP and FTP can resume downloads that are interrupted. Not all Internet servers support "resume" requests, however, so the phenomenon that Goetz writes about won't necessarily happen with every Internet download that gets interrupted.

You can increase your odds of successfully resuming a botched download by using GetRight, a $17.50 shareware program from HeadLight Software.

You start a download by dragging the file link from the Web page to your GetRight download box. You can configure the program to download files to specific directories, to automatically run all downloads through a virus checker, and to download files through an FTP link instead of a slower Web one.



If the download is interrupted for whatever reason—even because of a power outage—you can continue the file transfer by clicking on GetRight's *Resume* button. But just like your browser, GetRight can't resume all broken transfers; its ability to do so depends on whether the site you're downloading from supports resume requests. You can download the Windows 95 or NT version of GetRight from HeadLight Software's Web site (www.headlightsw.com) or from PC World Online. ▶

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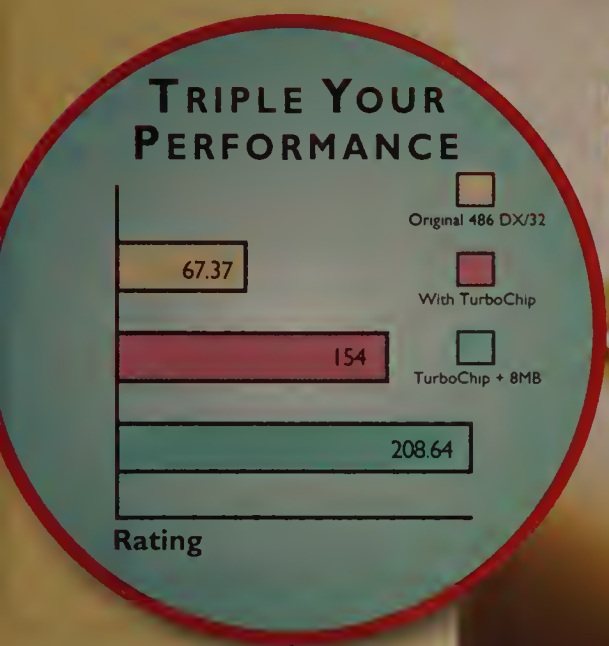

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INTERNET MAIL BONDAGE

WHILE BACKING UP my hard disk recently, I discovered a 112MB file called 'deleted items.mbx' in my Internet Mail and News directory [part of Microsoft's Internet Explorer]. When I opened it I found that it contained every e-mail message I had ever deleted since June 1996, when I first got on the Net. Holy cow!

Brandon Cole, Cincinnati

WHEN YOU DELETE a file, it's usually not really gone. It's invariably left lingering in a dark corner of your hard disk, accessible to employers, ex-spouses, and blackmailers. To force Internet Explorer to really wipe out the messages you've marked for deletion, click IE's *Mail* icon, then click *Read Mail*. In the mail program, select *Mail•Options*. Click the *Read* tab and check *Empty messages from the 'Deleted Items' folder upon exit.*

ADD SPECIAL EFFECTS TO WEB PAGES WITH LVIEW PRO

ONE OF MY FAVORITE programs for creating Web page graphics is MMedia Research's nifty $30 shareware program LView Pro. Look for Windows 3.*x*, 95, and NT versions on PC World Online. LView Pro is especially good for working with scanned photos because it includes lots of features for brightening, sharpening, and adjusting colors. Here are a few tutorials.

Sweeten a scanned image. When you scan a photo or a piece of art, the colors in the scanned image aren't as vivid as those in the original, and the picture looks furry.

1. To sharpen an image, select *Retouch•Image Filters*, then select *Sharpen* in the Image Filter Control Panel. Click *Help* for instructions. Click *Exec* to make your changes, then click *OK*.
2. To heighten contrast, select *Retouch•Contrast Enhancement*. Nudge the scrollbar toward the C for more contrast or toward the o for less. Click *OK*.
3. To smooth an image if it has too much detail, select *Retouch•Image Filters*, choose *Smooth* in the Image Filter Control Panel, then click *Exec* and *OK*.

Create a transparent background. Start by "cutting out" the foreground and placing it on a solid-color background. Then follow these steps:

1. Select *File•Save As* and choose *GIF89a* from the 'Save as type' drop-down list.
2. Select *File•Properties* and click the *GIF* tab. Make sure 'Save transparent color information in GIF89a files' is checked. Click the *Quantizing* tab, select either *256 Colors* or *Black and White*, and click *OK*.
3. Select *Retouch•Background Color*, pick any color, and click the *Dropper* button.
4. Go back to your image. Using the dropper, click the color you want to be transparent. (You won't see the change.) Save the image again in GIF89a format.

For the page shown in **FIGURE 2**, I used a bright blue background because that color appeared nowhere else in the picture.

5. Now start your browser and open your Web page to see if the background shows through where you want it to.

Add shadowing to letters. To create letters with shadowing, you create one set in gray and an identical copy in black. You then blur the gray set and move the black set on top of it, offset by just a few pixels.

1. Select *Edit•Add Text*. Type your text in the 'Text to add' box. Click *Foreground*, select gray in the palette, and click *OK*.
2. Adjust the font and type size if needed, then click *Exec* and *OK*.
3. Select *Retouch•Image Filters*, click *Yes* at the prompt, select *Blur* in the Image Filter Control Panel, click *Exec*, and click *OK*.
4. Select *Edit•Add Text* again; your text should still be in the 'Text to add' box. Leave all the settings the same. Make sure *Transparent text background* is checked. Then change the text's color to black.
5. Position the black letters by moving the slide bars below Modify Selection Area. Click *Exec*, then click *OK*.
6. Save your file in GIF89a format.

• LView Pro $30 if delivered by e-mail, $35 (disk) or $40 (CD-ROM) by first-class mail; MMedia Research; 954/458-9698 (fax); www.lview.com

READER SERVICE NO. 615

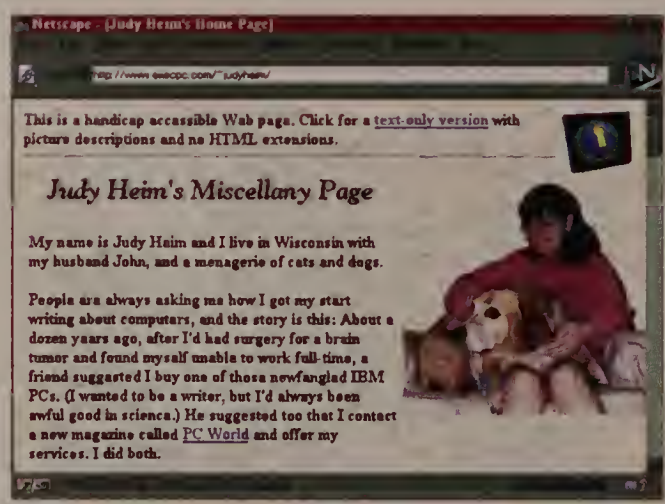

FIGURE 2: A TRANSPARENT BACKGROUND and shadowed letters enhance a Web page.

HIDE YOUR WEB TRACKS

IN MY WINDOWS directory I found a 14MB file named win386.swp that contains every URL I've visited recently. Can I delete this file? I share my PC, and I'd like to keep my Web travels private.

Beth Twomey, Belmont, Massachusetts

WIN386.SWP IS A swap file that Windows 3.*x* and Windows 95 create on start-up, then delete when you exit. The only way to get rid of it is to exit Windows.

FIRE UP NAVIGATOR FROM THE INTERNET ICON

DAVE BEAUCHEMIN of Montreal says that you can edit Windows 95's Registry so that Netscape Navigator launches instead of Microsoft's Internet Explorer when you click *The Internet* on your desktop. But before you tweak the Registry, back up the following files: user.dat, user.dao, system.dat, and system.dao.

1. Select *Start•Run* and type **regedit**.
2. Expand *HKEY_CLASSES_ROOT•CLSID•{FBF23B42-E3F0-101B-8488-00AA003E56F8}•Shell•Open*.
3. Click *Command* on the left, and double-click *(Default)* on the right.
4. Change the path in the Value data line so it points to Navigator. For example, type **C:\Progra~1\Netscape\Commun~1\Program\netscape.exe**. (If a directory name exceeds eight characters, count six characters, then replace the rest with **~1**.)
5. Press **<F5>** to refresh the Registry.
6. Double-click *The Internet* on your desktop to launch Navigator.

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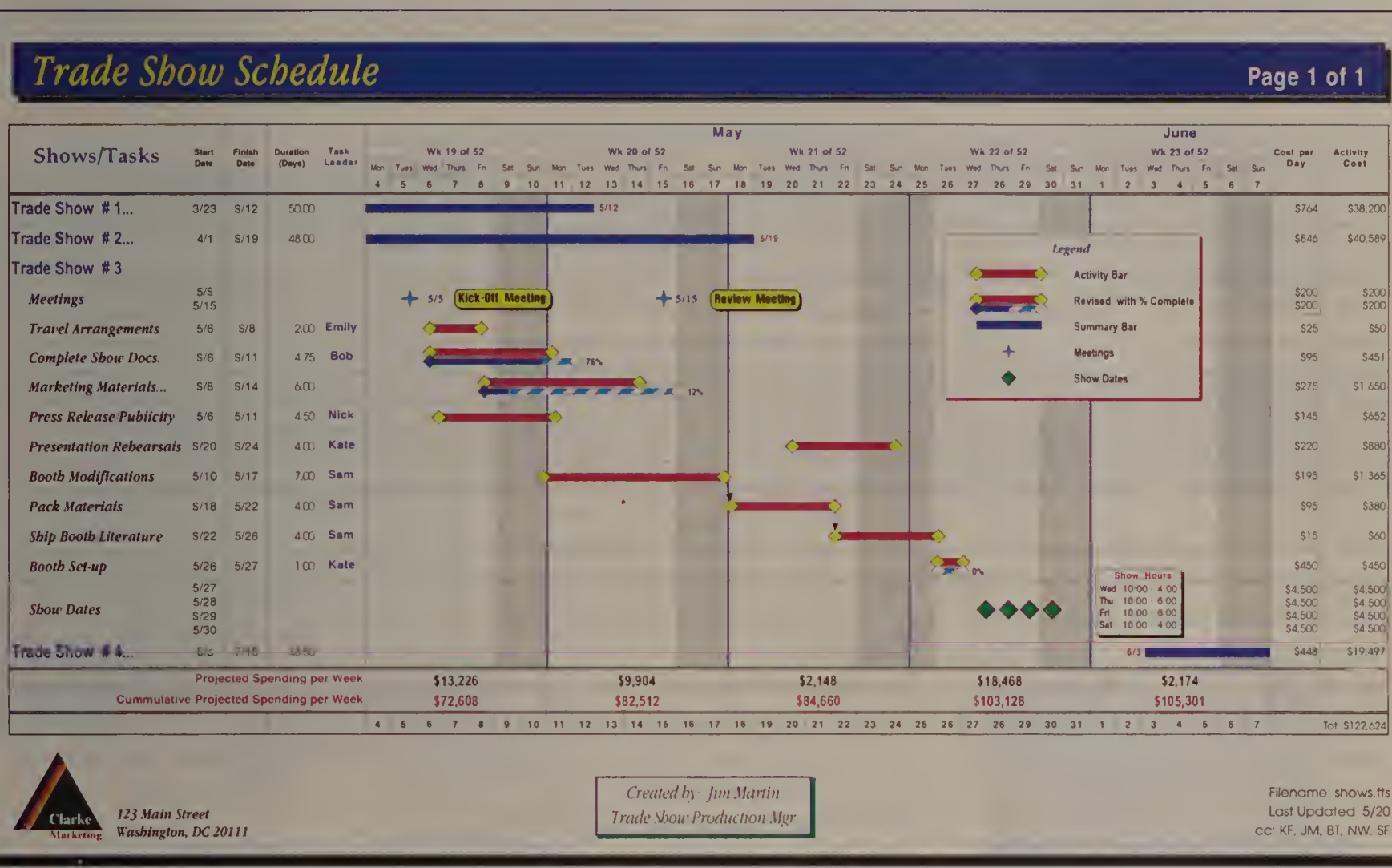

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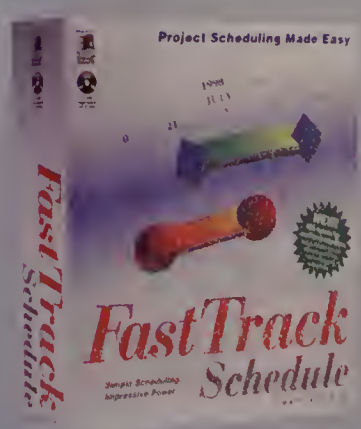

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Circle 14 on reader service card

Tune Up Your Memory

LAST MONTH I covered memory upgrades (remember?). Here are a few more steps you can take to increase your PC's memory performance, plus two things you should avoid.

GO UNDER THE HOOD

WINDOWS 95's System Monitor is a great tool for peering into the inner workings of your computer's memory allocation. System Monitor is found in Start•Programs•Accessories•System Tools; install it from your CD-ROM if you don't have it. This utility lets you display real-time graphs of 16 parameters that illustrate how your PC's memory is allocated.

Among these, *allocated memory* is a measure of Windows 95's overall needs. It's a combination of swappable memory and other memory, and changes with demand. And *free memory* is just that. Don't worry if it seems too low; Windows 95 automatically assigns idle memory to the disk cache. To monitor a given program's memory demands, observe the changes on the graph as you load a program, pause, and unload it (see **FIGURE 1**).

REAL MODES, REAL PROBLEMS

ONE KEY WAY of optimizing memory performance is to use the protected-mode device drivers that were written for Windows 95 and to avoid using any older, real-mode drivers that were designed for DOS. (Real-mode drivers must be loaded into the first 1MB of memory, which is a real performance drain.)

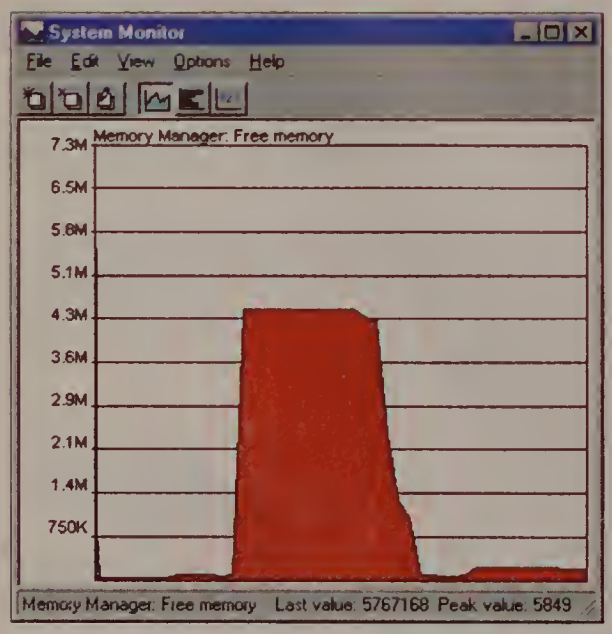

FIGURE 1: SYSTEM MONITOR SHOWS how memory usage changes when you open and close programs.

To check for old drivers, open the Control Panel, double-click the *System* icon, and click the *Performance* tab. Any real-mode ("MS-DOS compatibility mode") drivers will be listed (see **FIGURE 2**). Click the *Details* button for suggestions on how to update drivers.

Sometimes you can't avoid real-mode drivers. If you need to run software in Windows 95's DOS compatibility mode—some games require this—then you'll need to add real-mode drivers for your mouse, joystick, or whatever to your autoexec.bat and config.sys files. And if the drivers take up too much of your 640K of conventional memory, you'll also need to add a memory manager. Remember what fun *that* was?

Windows 95 provides the same medieval memory management tools as DOS 6.*x*. In order to place drivers in the upper memory block between 640K and 1MB, you'll have to add your old friends DOS=HIGH, UMB, himem.sys, and emm386.exe to your config.sys. Then you can use the DOS Memmaker utility to find the optimal placement of the drivers in memory and upper memory. You'll find memmaker.exe on the Windows 95 CD-ROM in the other\oldmsdos directory. If you need a DOS refresher, check out the Windows 95 Resource Kit help file—win95rk.hlp—on the Win 95 CD-ROM in the admin\reskit\helpfile directory.

Alternatively, you can buy a memory manager like Quarterdeck's QEMM 8.

DON'T TRY THIS AT HOME

IN THEORY, you can squeeze a little more performance out of your system with memory compression software. These programs compress more data into existing memory—much like a file compression program compacts your files—and thus minimize the need to access the hard disk's swap file. Some even claim to make 8MB of memory perform like 16MB. Unfortunately, *PC World* tests of three memory compression programs (Agent 97, Hurricane 2.03, and MagnaRAM 97) yielded disappointing results. All of these programs actually *slowed* performance on at least one of the nine tasks tested, some by as much as 12 percent. And with the exception of tasks that manipulate graphics files, most performance gains were less than 10 percent.

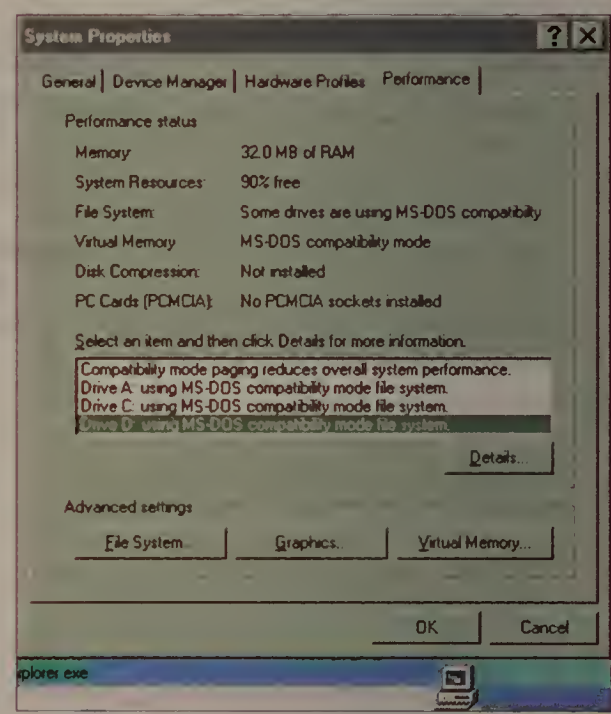

FIGURE 2: SPOT REAL-MODE DEVICE DRIVERS in System Properties, and replace them if you can.

For the price of one of these packages, you can buy at least 8MB of memory—a much better choice.

One final thing to avoid. If you're tempted to recycle those old 30-pin SIMMs you've got lying around from your old PC, don't. There are adapters on the market that let you snap 30-pin SIMMs into a 72-pin socket. But buying new memory may be cheaper, and the adapters sometimes overheat and cause errors.

• **QEMM 8 $65 street; Quarterdeck; 800/354-3222; www.quarterdeck.com**

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online *Find additional tips at www.pcworld.com/hereshow.* Hardware Tips *welcomes your questions and tips and pays $50 for published items. Kirk Steers is a contributing editor for* PC World. *See page 14 for contact information.* ■

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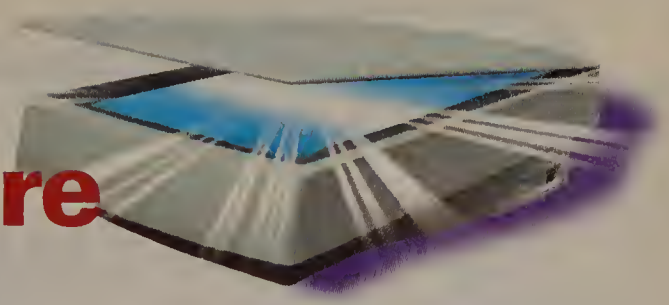

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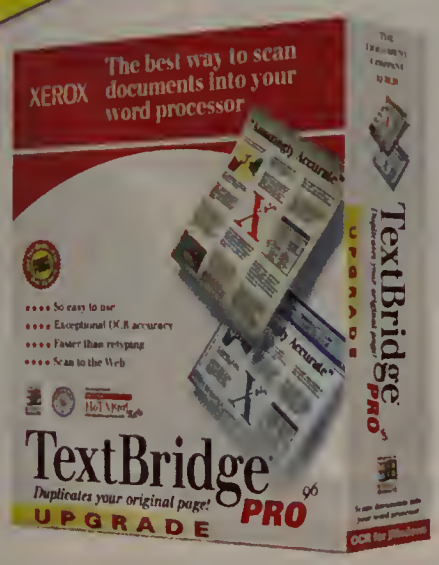

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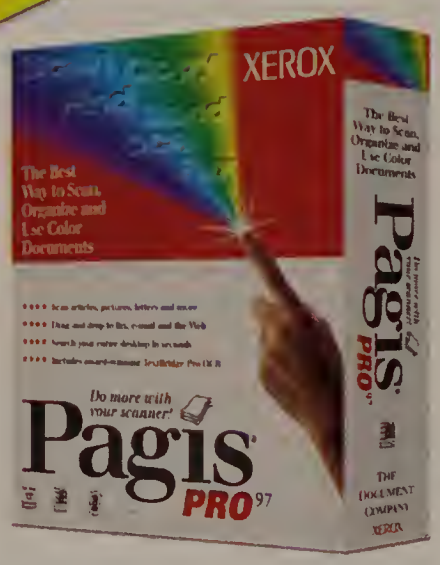

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Pick the Right Speakers

I WANT BETTER sound than I get from the small, anemic speakers that came with my multimedia PC. What sound system do you recommend for playing multimedia, games, and music CDs?

Jana Nicol, Internet

YOU'RE IN FOR a treat! There's a slew of reasonably priced PC sound systems on the market today that provide great audio for CD-ROM multimedia and games, business presentations, and Internet music—they're even good enough to pump out the music at your next party.

Multimedia PCs often come bundled with low-end speakers that sound flat and tinny. You'll get better audio by upgrading to higher-performance speakers with more power, wider frequency response, and other sound improvements.

Altec (www.altecmm.com), Koss (www.koss.com), Labtec (www.labtec.com), Nakamichi (www.nakamichiusa.com), Yamaha (www.yamaha.com), and others offer PC speaker systems, typically priced between $75 and $150. If you're willing to pay more, you can get higher-end speakers that sound as good as a home hi-fi system from Atlantic Technology (617/762-6300), Audix (www.audixusa.com), Bose (www.bose.com), Cambridge SoundWorks (www.hifi.com), Sony (www.sony.com), and other suppliers. Here are the key buying issues:

Sound card. The sound quality of your multimedia PC depends as much on the installed sound card (or sound-equipped motherboard) as it does on the speaker system. For the best audio reproduction, use a wavetable synthesis sound card capable of delivering 16-bit, 44.1-kHz stereo sampling.

Unlike older and inferior FM synthesis cards, wavetable cards let a PC play back digitized samples of real musical instruments and sound effects, providing a vastly superior audio experience. And if you're interested in playing back orchestral MIDI scores or you want full-duplex audio for communications software and interactive gaming, get a card that supports 64 musical instruments (instead of only 32) from Creative Labs (www.creaf.com), Ubi Soft (www.ubisoft.com), or others.

Two-piece versus three-piece speakers. Many two-piece speaker systems can produce excellent sound for any number of applications. But the most popular systems these days are three-piece speakers: two *satellites* (left and right speakers) and a separate subwoofer. The satellites manage mid- to high-range frequencies (150 Hz to 20 kHz), while the under-desk subwoofer handles the low range (20 to 150 Hz), creating a much stronger and more distinct bass. If you're not ready for bone-rattling bass, you can go with a two-piece system that has an optional subwoofer output jack in case you want to upgrade later.

Speaker performance. The best way to judge performance is to audition the speakers with your own ears. You'll generally find the best listening rooms at consumer electronics and hi-fi stores. If possible, take your favorite music CDs with you for the test drive, and play a wide variety of recordings.

Speaker controls. Manual controls for power, volume, tone, mute, and such are generally faster and easier to use than software-based controls—as long as all the knobs are within easy reach.

3-D sound. If you're a game or multimedia enthusiast, three-dimensional sound may add a lot to your enjoyment. Several 3-D sound technologies are available, each creating the illusion (with just a two- or three-piece speaker system) that you're surrounded by sound. To hear 3-D audio, you need a speaker system or sound card that supports 3-D sound technology, as well as a CD-ROM multimedia title or game that has 3-D audio. By itself, a sound card with 3-D audio-processing capabilities can provide "surround sound" on any two speakers, but you'll get better results from a speaker system designed to reproduce 3-D audio. And such speakers can provide surround sound even if your sound card lacks 3-D audio support.

Several manufacturers offer speakers that support various 3-D sound technologies, ranging in cost from $100 to $500, and many MMX-enhanced multimedia titles provide 3-D sound.

Altec Lansing's ACS55 Power Gaming Speaker System with Dolby Multimedia Surround Sound is a good example of an entry-level 3-D sound system. The three-piece setup provides six speaker drivers—housed in two satellites, plus a separate subwoofer—to deliver five audio channels and create the illusion of 3-D sound.

The system also comes with WaveCube, a software MIDI driver that lets you steer the audio of any MIDI sound track. For example, in the figure below, drag the jazz guitar icon in the graphical sound stage to the left rear corner, and you'll hear the guitar playing from that side of the room.

CREATE A CUSTOM 3-D SOUND STAGE with WaveCube, a MIDI utility bundled with Altec Lansing speakers. Drag an instrument around the stage, and you'll hear the sound shift in the speakers.

• ACS55 Power Gaming Speaker System with Dolby Multimedia Surround Sound $200 street; Altec Lansing; 800/648-6663; www.altecmm.com

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Find additional tips at www.pcworld.com/hereshow. Richard Jantz is a consultant and freelance writer in Kensington, California. See page 14 for contact information. ■

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Replace Your CMOS Battery

IS YOUR PC CLOCK LOSING TIME? That's a warning that its CMOS battery is about to go. And when it does, you'll have a very hard time using your computer until you change the battery.

This battery powers both the PC's internal time clock and a CMOS memory chip that holds all the PC's crucial setup information, such as hard disk parameters and amount of memory.

There are many types of CMOS batteries, and their life expectancy varies widely. The lithium batteries installed in PCs for the last year or two should last five or six years, but batteries in older PCs last an average of two to three years.

CMOS batteries often die slowly. A dead CMOS battery usually displays a 'CMOS Read Error' or 'CMOS Battery Failure' message when you turn on your PC. That means your PC has no idea how to start up because its crucial parameters are lost. Some older systems make it even harder, displaying a cryptic error message. Here's how to change your CMOS battery. For more details, especially on older models, see www.pcworld.com/hereshow.

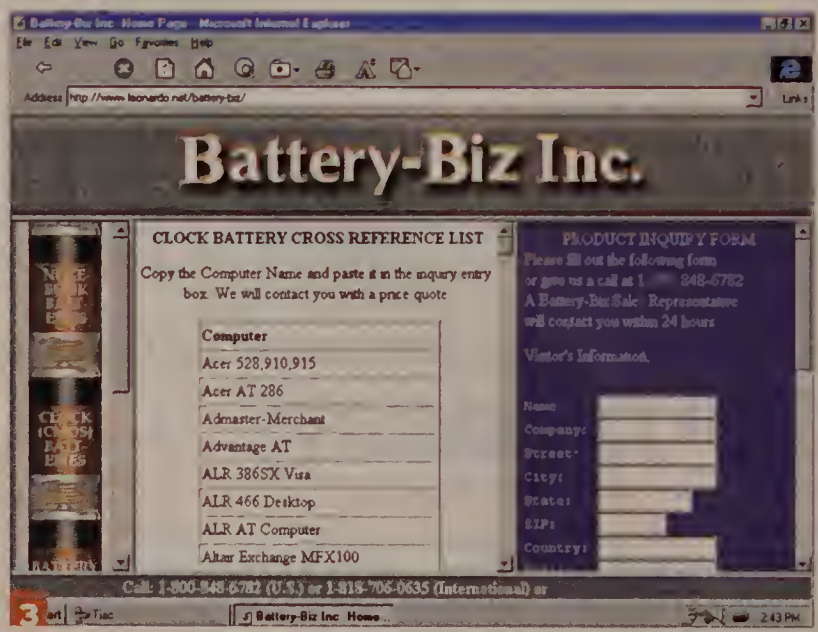
Stan Miastkowski is a contributing editor for PC World.

1

Save the setup information. Either go through the PC's setup screens and write down all the settings, or back up settings with a program such as Norton Utilities.

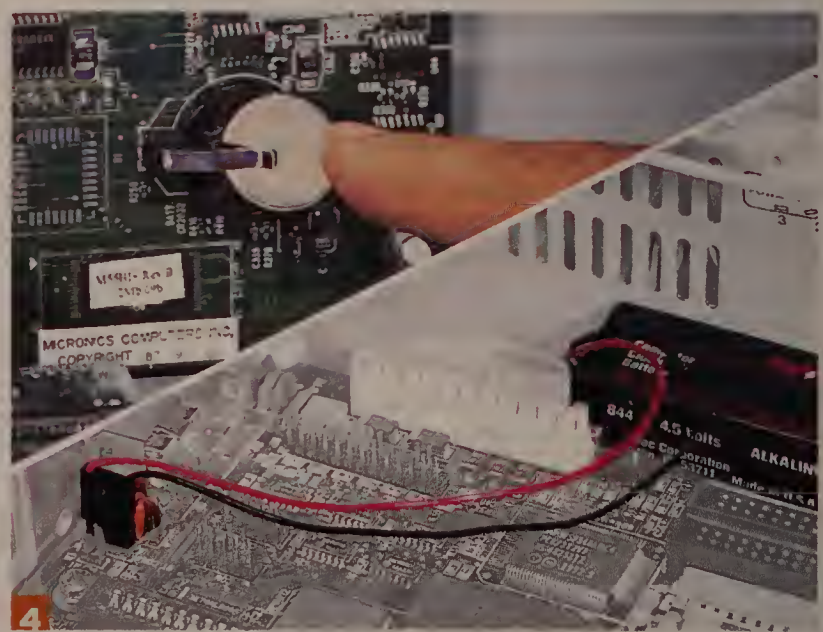
2

Find the current CMOS battery. If you're lucky, your PC's manual will tell you where the CMOS battery is located, what type it is, and how to change it. More often, it says little or nothing. Turn off your PC, open the case, and take a look around. The types of CMOS batteries fall into a few basic categories, shown above, distinguished by packaging, wiring, voltage, and chemistry.



3

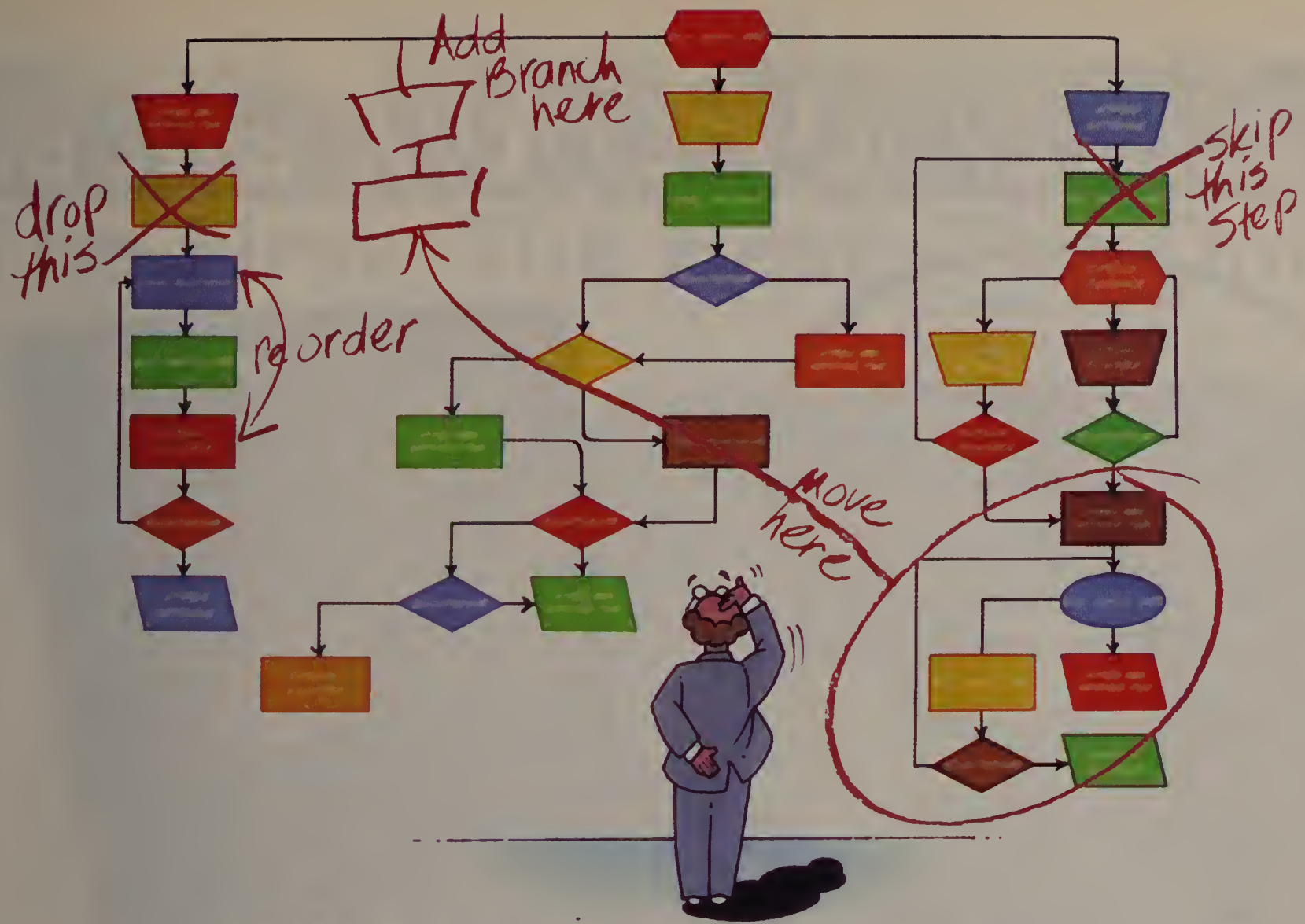
Buy the right battery. If your computer dealer or system vendor doesn't have the right replacement battery, try Battery-Biz (800/848-6782, www.battery-biz.com/battery-biz) or Resource 800 (800/430-7030, www.dalias.net/~r800).



4

Replace the battery. Remove the old battery, put in the new one, turn on the PC, and read any error messages. In your PC's setup program, enter the date and time. If needed, enter other settings or restore them from the backup floppy created with your utility program. ■

PHOTOGRAPHS: KEVIN CANDLAND



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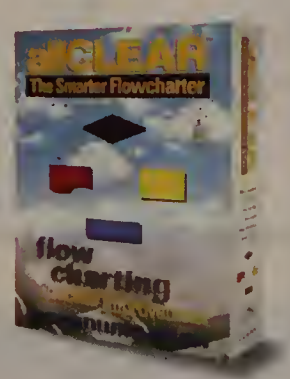

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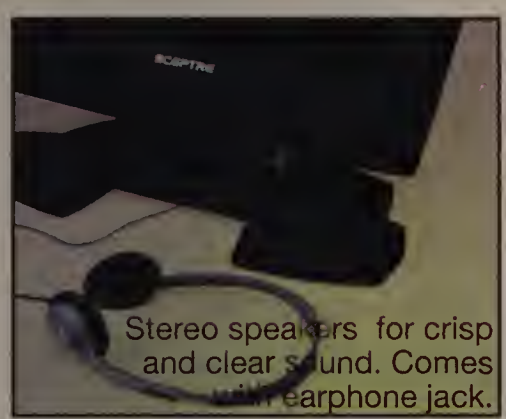

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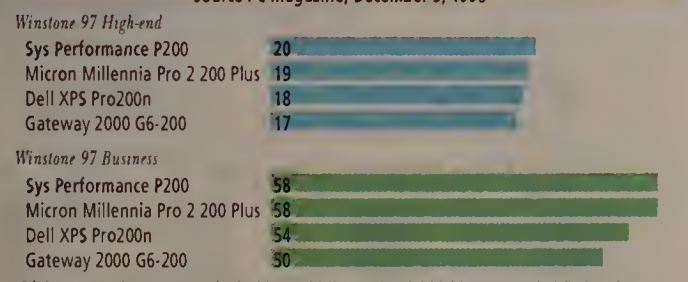

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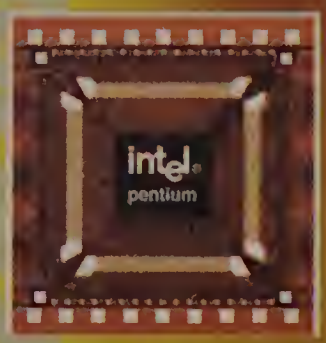

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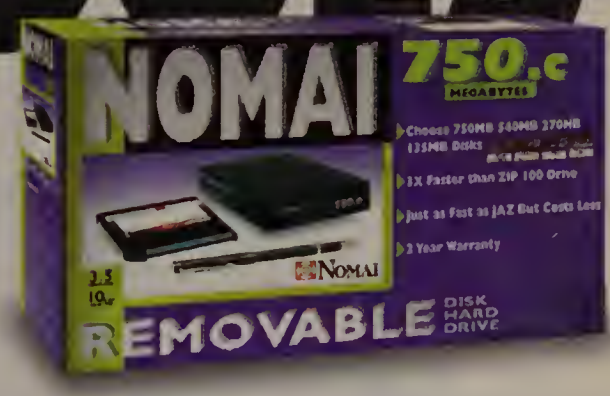

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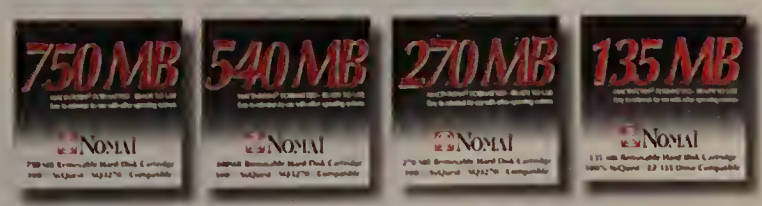

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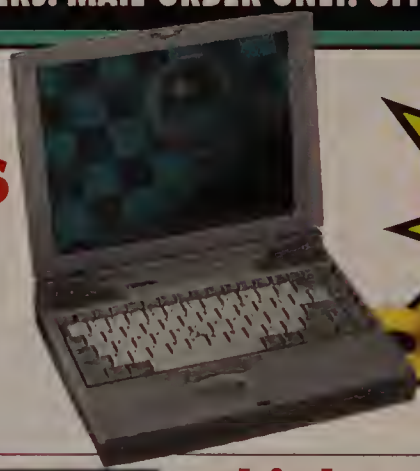

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Packard Bell	P150, 32MB, 2.1GB	842948	949.95
Under $1300			
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Apple	PPC 200, 16MB, 2.0GB	M5168LL/A	1199.95
HP *	P200, 32MB, 3.1GB	D3903A#ABA888	1299.95
NEC	P166, 16MB, 2.1GB	102-00197	1299.95
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HP *	P166MMX™, 16MB, 2.1GB	D3931A#ABA888	1299.95
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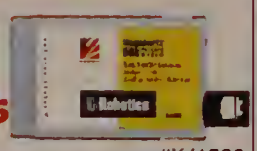

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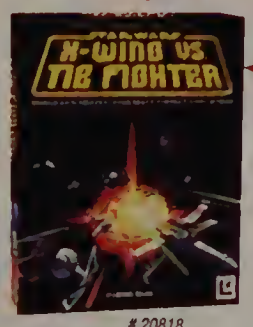

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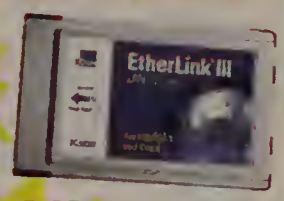

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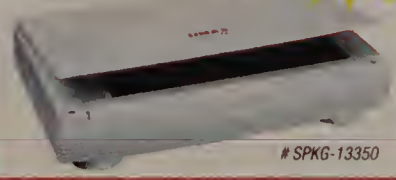

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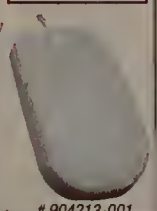

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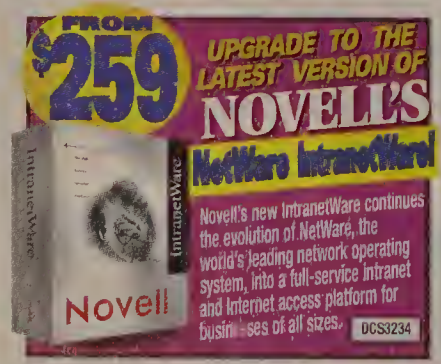

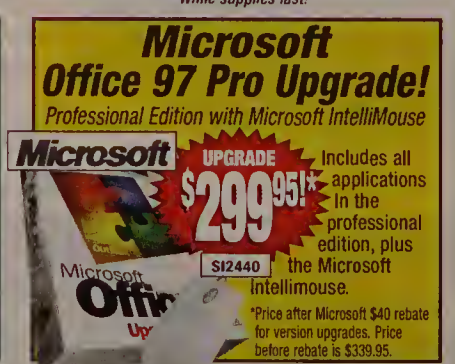

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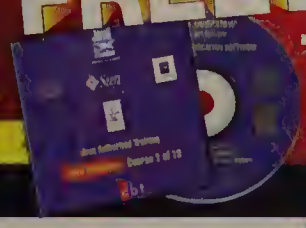

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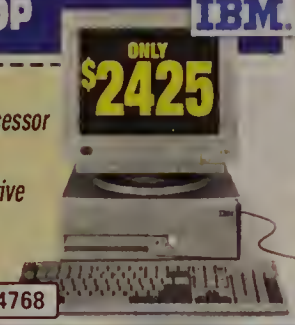

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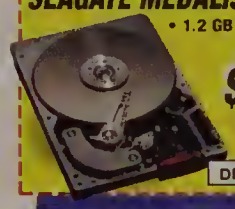

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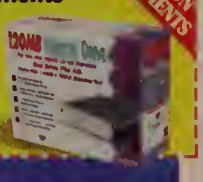

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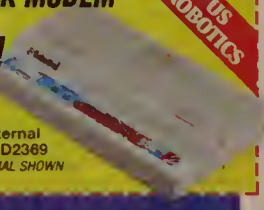

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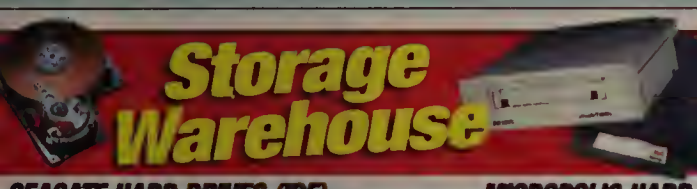

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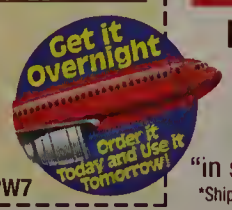

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2 x 36 0 mg	62 00	61 00
4 x 36 16 mg	102 00	101 00
8 x 36 32 mg	190 00	199 00
16 x 36 64 mg	480 00	480 00
1 x 32 4 mg	25 00	24 00
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8 x 32 32 mg	160 00	168 00
16 x 32 64 mg	456 00	456.00
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8 x 32 32 mg EDO	478 00	478 00

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Unbuffered	16Mg	32Mg	64Mg	128Mg	256Mg
3 3V ECC, EDO	119	239	479	1209	—
3 3V EDO	99	199	387	—	—
5 0V EDO	Call	Call	Call	Call	Call
5 0V FPM	Call	Call	Call	Call	Call
Buffered					
3 3V ECC, EDO	110	239	479	1200	—
3 3V ECC, FPM	110	239	480	1200	2689
APPLE					
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4 x 64	32Meg				180 00
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3 3V 8/32 chip	64Meg				470/545
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32Kx8 (3 3V)	–	14 00	9 50	–
64Kx1	–	1 00	9 00	8 00
64Kx8		15 00 (5V)	–	–
128Kx8	–	29 50	26 00	24 00
32x8 SOJ 3 3V		12 00	11 00	0 00
128x8 SOJ	–	89 00	–	–
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1Meg x4			19 00	18 00	17 00
1Meg x4 (Zip Pin)			12 00	11 00	10 00
256x4 Page Dip	–		7 25	6 75	6 50
256x4 Page Zip	–		0 25	0 00	8 95
256x4 Video Zip				10 95	9 95
256x8 (SOJ)			12 00	11 00	–
256x16 SOJ	34 00	29 00	29 00	10 00	–
256x16 SOJ Edo		–	29 00	–	–
256x16 Video Zip	–	–	–	29 00	–

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Dimension XPS Pro 150n 180n 200n (pairs) edo	4Meg/8Meg/16Meg/32Meg	26/49/89/179

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AMOUNT UPGRADED	OK 0d	256k	1	2	3	3 5	4	5	6	8	16	32
Brother 630 631, 641 645	–	–	39	59	–	–	–	–	–	–	–	–
Canon LBP 430	–	–	39	–	–	–	39	–	–	–	–	–
Canon LBP 860 1260	–	–	–	19	–	–	39	–	–	69	69	179
Canon LBP4 4Lite 4plus	–	–	129	179	–	–	–	–	–	–	–	–
Epson Action Laser 1100 1600	–	–	19	29	–	–	59	–	–	09	99	–
Epson Action Laser II	–	–	74	–	173	–	–	272	–	–	–	–
Epson 8000 1800 4000 4100 4300	–	–	89	–	173	–	–	272	–	–	–	–
Epson 1000, 1500, 5000, 5200	–	–	–	49	–	–	98	–	–	–	–	–
HP 2 20–	–	–	–	59	–	–	79	–	–	–	–	–
HP 3, 30, 3P, 2P 2P+	–	–	–	59	–	–	79	–	–	–	–	–
HP 4 4M 4Si 4SiMX	–	–	–	19	–	–	49	–	–	79	–	–
HP 4P 4PLUS, 4MPm 1600 1600CM	–	–	9	19	–	–	39	–	–	69	–	–
HP 4L	–	–	29	–	–	–	–	–	–	–	–	–
HP 3SI	–	–	9	–	–	–	39	–	–	69	–	–
HP 5L	–	–	39	49	–	–	67	–	–	99	–	–
HP 5P 5MP, 4V 4MV 6P 6MP	–	–	9	10	–	–	39	–	–	69	99	–
HP Design Jet 600 650 200	–	–	–	19	–	–	39	–	–	69	109	199
HP Design Jet 700 750C Plus	–	–	–	–	–	–	29	–	–	49	89	179
HP Deskjet 500 500C, 510, 550,560	–	*29*	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	39	–	–	49	–	–	89	–	–
HP Paintjet XL300	54	–	–	–	–	–	60	–	–	144	299	–
IBM Laser 4019, 4019E	–	–	–	–	–	109	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	49	–	–	–	–	–
IBM Laser 4030, 4079	–	–	–	30	–	–	89	–	–	90	–	–
Lexmark Medley 4C 4x, 4SX	–	–	Call	Call	Call	–	–	–	–	–	–	–
Lexmark Optra L, LX R RX	–	–	–	–	–	–	39	–	–	50	89	189
Lexmark Valuewriter 300,600	–	–	29	39	–	–	09	–	–	–	–	–
Lexmark Winwriter 200 400 600	–	–	29	39	–	–	89	–	–	–	–	–
NEC 90, 290	–	–	–	89	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	59	–	–	–	–	–	–	–	–
Oki 400	–	–	–	59	–	–	–	–	–	–	–	–
Oki 400E 400EX, 410E 410EX	–	–	67	89	169	–	189	–	–	–	–	–
Oki 810E, EX 600E EX, 610E EX	–	–	29	79	–	–	119	–	–	149	229	–
Oki 830 840	–	–	–	59	–	–	–	–	–	–	–	–
Panasonic 4420/4450I	–	–	–	79	–	–	109	–	–	–	–	–
Panasonic 4419/4430	–	–	–	59	–	–	89	–	–	–	–	–
Panasonic 4450	–	–	89	–	–	–	–	–	–	–	–	–
Panasonic 4400/5400	–	–	49	69	–	–	109	–	–	–	–	–
Panasonic 4440, 5410	–	–	89	–	–	–	109	–	–	–	–	–
Panasonic 6500	–	–	14	29	–	–	69	–	–	–	–	–
Sharp 9400 9460, 9600, 9700E	–	–	49	69	–	–	119	–	–	–	–	–
Sharp 9500, E, H, 9700, H	–	–	49	–	–	–	236	–	–	–	–	–

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Compaq Aero, 400, 410, 420, 430	109	Sharp 8700, 8800, 8900	129
Compaq LTe 5000 Series	139	TI Exstensa 450, 455, 510, 515	139
Epson Action Note 650, 660	119	TI Exstensa 550, 555, 560, 570	149
Epson Action Note 800, 868, 880, 910	119	TI Exstensa 600, 605, 650	169
IBM Thinkpad 355, 360	119	Toshiba 400, 405, 410, 415, 420, 425, 430 (NIMH)	219
IBM Thinkpad 365 C, ED, XD	129	Toshiba 100, 105, 110, 115, 200, 205	105
IBM Thinkpad 701	109	Toshiba 2100 Series	99
IBM Thinkpad 750, 755	179	Toshiba 2400, 2450, 1900, 1950, 1960	109
IBM Thinkpad 755 CD, CE, CV, CX	179	Toshiba 4700, 4800, 4850, 4900	109
NEC Versa 2400, 2405, 2430, 2435	159	Toshiba T4500, T4600	159

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Tecra 700 (SDRAM)	8Meg/16Meg/32Meg	79/139/243
Tecra 710, 720	8Meg/16Meg/32Meg/64Meg/128Meg	79/139/249/649/1294
Tecra 730 CDT 730X CDT 740 CDT	8Meg/16Meg/32Meg/64Meg	Call
T2900SXE/2290SX/T1609, 1859, C	*6Meg*	*94.99*
T2100, 2195, 2159, 2155, 2110, 2115	*4Meg/8Meg/16Meg/24 Meg*	*30/59/120/189*
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	*4Meg*	*30.99*
T4500, C, T4600, T4700, T1900, C, T1910, T1959 (3.3 v)	*8Meg*	*79.99*
T4500, C, T4600, T4700, T1900, C, T1910, T1959 (3.3 v)	*16Meg/32Meg*	*139/243*
T3400CT, T2400, T3690	*4Meg/8Meg/16Meg/24Meg*	*59/79/149/199*
T100, 105, 119, 115, 295, 210	*6Meg/16Meg/32Meg*	*70/120/239*
T409, 495, 419, 415, 420, 425, 430	*8Meg/16Meg/32Meg*	*79/120/239*
T400CS 400CDT, T100, 105 Edo	8Meg/16Meg/32Meg	79/129/239
T600, 810, CT Edo, 660	8Meg/16Meg/32Meg	79/129/239

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MODEL	AMT. UPGRADED	PRICE
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ACERNote 763, 765 782, 784 786	4Meg/8Meg/16Meg	49/69/129
ACERNote Light 350, 352, 355	*4Meg/8Meg/16Meg*	*49/89/120*
ACERNote Light 358, 356, 359, 381 (pairs) edo	*4Meg/8Meg/16Meg*	*49/89/120*
ACERNote Nuovo 971, 972	8Meg/16Meg/32Meg	69/125/239
ACERNote Pro 950, 954 955 957 959 (pairs)	4Meg/8Meg/16Meg	59/79/139
Ambra SN Series	*4Meg/16 Meg*	*60/140*
Ambra N-75, N-100	*4Meg/8/16*	*49/79/130*
AST Ascentia A41, A42	*8Meg/16Meg/32Meg/64Meg*	*70/139/280/620*
AST Ascentia P30, P50	8Meg/16Meg/32Meg	79/149/269
AST Ascentia J10, J30 J50	8Meg/16Meg/32Meg/40Meg Kit	79/129/249/359
AST Ascentia 900N, 800N, 810, 910	*6Meg/16Meg*	*79/129*
AST Ascentia 950	*8Meg/16Meg*	*79/130*
AST Bravo & Explorer	*4Meg/16Meg*	*79/140*
AT&T Globalyst 130, 200, 259	*4Meg/8Meg/16Meg*	*40/70/139*
Austin DX4, DX2, SX2, SX Series	*4Meg/16Meg*	*69/180*
Austin Edge CD P 133 edo	8Meg/16Meg	89/149
Austin Edge Duet (pairs) edo	16Meg/32Meg	129/229
Austin Vista	4Meg/8Meg/16Meg/24Meg	49/79/139/199
Canon 110D (pairs)	*4Meg/8Meg/16Meg*	*59/70/129*
Canon Innova Book 150, 175	*4Meg/16Meg*	*59/130*
Canon Innova Book 200LS	4Meg/8Meg/16Meg/24Meg	59/89/179/249
Canon Innova Book 350CD 360, 475	8Meg/16Meg	59/129
Canon Innova Book 4B9, 400 edo	*6Meg/16Meg*	*80/149*
CTX EZ Book 500, 600, 700 Pent. Series	4Meg/8Meg/16Meg	59/89/139
DEC HiNote	*4Meg/8Meg/16Meg*	*59/80/139*
DEC HiNote Ultra, Ultra II	4Meg/8Meg/16Meg	49/69/129
DEC HiNote VP 520, 525, 535 545 (pairs)	8Meg/16Meg/32Meg	89/139/260
DEC HiNote VP 5100, 5120	8Meg/16Meg/32Meg/64Meg	79/139/219/699
DEC HiNote VP Css, LSS, CTS, LTS	8Meg/16Meg/32Meg	79/139/269
Dell Latitude LM (pairs)	4Meg/8Meg/16Meg	59/79/129
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Epson ActionNote 88D, 866c 890 910	4Meg/8Meg/16Meg/20Meg	49/79/139/199
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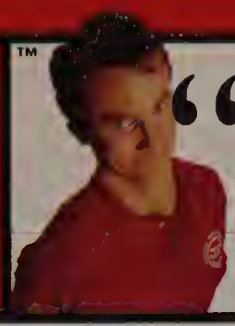

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Toshiba T4700, T4800, T4850	$445.44 87501	—	—
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NEC Varsa 2000, 4000	$449.01 87500	$559.88 82845	—
NEC UltraLite, Versa E, V, M, P	$428.01 87499	$559.23 71587	$735.56 88869
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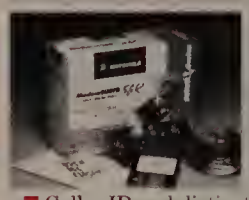

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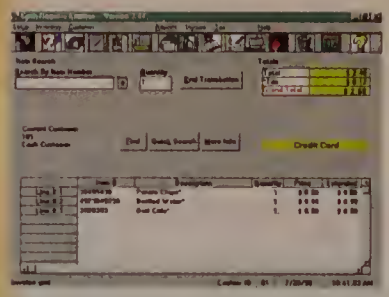

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PANASONIC
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KXP-6100 300dpi / KXP-6500 600dpi ... 286/329

OMS
Magicolor CX Laser, 20M, 12ppm 600dpi ... 4999

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Bravo LC 6233 Pentium-2 233MHz 2.0G 32M ... 2292
Bravo MS P-166 2G 16M 8x ... 1263
Bravo 5166M P166MMX 32M 2G 16X ... 1719
Bravo MS-T, PPro-200, 2.5G 32M 8X Win NT ... 1999

COMPAQ
Deskpro 2000 P-120 1.2G 8M/P-133, 1.2G 16M ... 1036/1379
Deskpro 2000 P-166, 1.2G 16M ... 1599
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Deskpro 4000 P-166, 2.5G 16M ... 2052
Deskpro 4000 Pentium-2 266MHz 2.5G 32M 8X ... 2549
Deskpro 6000 P-166 1.08G 16M 8x e-net ... 2090
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Vectra VL5 DT P-166 MMX 16M 1.6GB ... 1469
Vectra XA DT PP-200 2G 32M 16X 10/100BT ... 3589
Vectra 525 MCX MT P-166MMX 24M 2.5GB 16X ... 1989
Vectra 525 MCX MT P-200MMX 32M 3.8GB 16X ... 2679

IBM
PC350 P-166MMX 2.5G 16M ... 1499
PC330 P-200MMX 2.5GB 32M ... 1978
New! PC300XL Pentium-2 233MHz 2.5G 32M 16X NT ... 2629

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AST Servers
Manhatten D, P-200MHz, 4G 32M ... 3479
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Compaq Servers
Proliant 800 PPro-180 4.3G 32M ... 3479
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Hewlett Packard Servers
New! Netserver E-40 PP-180 2.1G 16M 8X ... 2596
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AST Advantage 9406 MMX-P200 4.05G 64M 16X ... 2333
Compaq Presario 4784 MMX-P200 4.3G16M+zip ... 2299
IBM Aptiva S78 P-166, 3.2G 16M 6xCD ... 2289

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Vaio PCV-100 MMX-P166, 2.5G 32M, 28.8 16xCD ... 1699
Vaio PCV-120 MMX-P200, 3.8G 32M, 28.8 16xCD ... 1999

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Equium 5160d P-166MMX 2.1GB 12X 32M ... 1749
Equium 5200D P 200MMX 2.5GB 12X 32M ... 1949
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IDE HARD DRIVES

IDE	*RPM*	*Brand*	*Model*	*Price*
1200MB	5400	Fujitsu	M1636T	$169
1275MB	4500	Seagate	ST31277A	$179
1281MB	5200	Western Digital	AC11200	$175
1300MB	4200	JTS	JTS1300	$169
1624MB	5200	Western Digital	AC21600	$186
1670MB	4480	Maxtor	M81750A	$195
1700MB	**5400**	**Fujitsu**	**M1623T**	**$179**
1700MB	4500	Seagate	ST31720A	$185
1750MB	4480	Maxtor	MB1750A	$190
1750MB	5400	Fujitsu	MPA3017A	$185
2000MB	4500	JTS	JTS2000	$180
2100MB	5400	Fujitsu	M1624T	$199
2000MB	5200	Western Digital	AC22000	$203
2100MB	4480	Maxtor	MB2100A	$200
2132MB	4500	Seagate	ST32132A	$197
2151MB	5400	Quantum	FB32160A	$199
2187MB	4480	Maxtor	MB2187A	$218
2500MB	**5400**	**Fujitsu**	**M1638T**	**$199**
2500MB	5200	Micropolis	MC4525A	$199
2559MB	5200	Western Digital	AC22500	$217
2560MB	5400	Seagate	ST52520A	$217
2560MB	5400	Maxtor	M82560A	$216
2620MB	5400	Fujitsu	MPA3026A	$209
3000MB	4500	JTS	JTS3000	$229
3166MB	5200	Western Digital	AC33100	$243
3228MB	5400	Quantum	FB33240A	$259
3245MB	4500	Seagate	ST33240A	$247
3500MB	4480	Maxtor	M83500A	$265
3500MB	5400	Fujitsu	MPA3035A	$249
4000MB	5200	Western Digital	AC34000	$312
4000MB	**5200**	**Micropolis**	**MC4540A**	**$309**
4310MB	5400	Quantum	FB34320A	$325
4326MB	4500	Seagate	ST34340A	$310
4335MB	3600	Quantum	BF4335A	$230
4370MB	5400	Fujitsu	MPA3043A	$355
5000MB	**5200**	**Micropolis**	**MC4550A**	**$385**
5120MB	5400	Maxtor	MB5120A	$395
5250MB	5400	Fujitsu	MPA3052A	$395
6448MB	5400	Quantum	FB36480A	$455
6450MB	5400	Seagate	ST56450A	$475
6480MB	3600	Quantum	BF6480A	$372

SCSI HARD DRIVES

Add a DPT 2044U Ultra SCSI controller $249

SCSI	*RPM*	*Brand*	*Model*	*Price*
1050MB	5400	Seagate	ST31055N	$269
2150MB	5400	Seagate	ST52160N	$305
2150MB	7200	Seagate	ST32171N	$509
2151MB	5400	Quantum	FB32160S	$287
3228MB	5400	Quantum	FB33240S	$355
4100MB	**7200**	**Micropolis**	**MC4341**	**$599**
4300MB	5400	Micropolis	MC4743	$449
4310MB	5400	Quantum	FB34320S	$417
4350MB	7200	Seagate	ST34371N	$759
4400MB	7200	Fujitsu	M2954S	$629
4550MB	7200	Micropolis	MC4345	$629
4550MB	7200	Micropolis	MC4345AV	$779
4550MB	7200	Quantum	XP34550S	$755
4550MB	10,000	Seagate	ST34501N	$929
6448MB	5400	Quantum	FB36480S	$565
9100MB	**7200**	**Micropolis**	**MC3391**	**$1050**
9100MB	7200	Fujitsu	M2949S	$1050
9100MB	7200	Quantum	XP39100S	$1215
9100MB	7200	Micropolis	MC3391AV	$1200
9100MB	7200	Seagate	ST19171N	$1295
9100MB	10,000	Seagate	ST19101N	$1599
23300MB	5400	Seagate	ST423451N	$2799

WIDE HARD DRIVES

Add a DPT 2044UW Ultra Wide SCSI controller for $279

WIDE	*RPM*	*Brand*	*Model*	*Price*
1050MB	5411	Seagate	ST31055W	$349
2150MB	7200	Seagate	ST32171W	$539
4294MB	**7200**	**Micropolis**	**MC3243W**	**$629**
4294MB	7200	Micropolis	MC3243WAV	$789
4350MB	7200	Seagate	ST34371W	$789
4400MB	7200	Fujitsu	M2954W	$659
4550MB	7200	Micropolis	MC4345W	$659
4550MB	7200	Micropolis	MC4345WAV	$829
4550MB	7200	Quantum	XP34550W	$775
4550MB	10,000	Seagate	ST34501W	$979
9091MB	**5400**	**Micropolis**	**MC3391W**	**$1080**
9091MB	5400	Micropolis	MC3391WAV	$1250
9100MB	7200	Fujitsu	M2949W	$1089
9100MB	7200	Quantum	XP39100W	$1239
9100MB	7200	Seagate	ST19171W	$1349
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Speed	Brand	Model	ms	Int
12X	Toshiba	XM5702B	115	$100
16X	Delta	DELTA16X	120	$88
16X	Lite On	LTN262A	120	$92
16X	Mitsumi	CRMCFX16X	120	$104
16X	NEC	CDR1600	100	$99
16X	Toshiba	XM6002B	90	$105
18X	Acer	AC616A	120	$105
20X	Lite On	LTN202A	120	$105
24X	Delta	DELTA24X	99	$99
24X	Panasonic	CR5B5	85	$125

IDE CD CHANGERS

Speed	Brand	Model	# Disks	Int
6X	NEC	CDR4X6	4	$89
8X	NEC	CDR4X8	4	$129

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25 Watt (SPEAKERJR) $99 35 Watt (SPEAKERPRO) $129
Universal sound cable(AUDIOMIX) $9
Turn any IDE CD ROM into an external for parallel printer port (PPCASECD) $99
Turn any IDE CD ROM into an external for PCMCIA port (PCMCIACASECD) $189

SCSI CD ROM

Speed	Brand	Model	ms	Int
12X	Toshiba	XM5701B	115	$149
12X	Plextor	PX12TS(tray)	105	$219
12X	Plextor	PX12CS(caddy)	105	$259
15X	Toshiba	XM3801B	99	$179
16X	NEC	CDR1610	100	$179
20X	Plextor	PX20TS	95	$239

SCSI CD CHANGERS

Speed	Brand	Model	# Disks	
4X	Pioneer	DRM624X	6 (ext)	$399
16X	Nakamichi	MJS16	4	$259

SCSI CD TOWERS

			4 Drive	7 Drive
12X	Toshiba	115ms	$899	$1579
15X	Toshiba	99ms	$1129	$2039
16X	NEC	100ms	$929	$1659
20X	Plextor	95ms	$1399	$2499

SCSI CD TOWERS w/ 4 Disc Changers

Nakamichi 16X 150ms $1299 $2275

CD RECORDERS

Sony 2x6
Internal SCSI drive (CDU926S) $339
Yamaha 4x6
Internal SCSI drive tray load (YCDR400T) $639
Internal SCSI drive caddy load (YCDR400) $649
Philips 2x6 ($200 Philips rebate until 6/30/97)
Complete kit includes software, controller, and 1 disk
Internal SCSI (CDD2600) $665
Hewlett Packard SureStor 6020i
SureStor 6020i includes software, and 1 disk
Internal SCSI (C4343CDR) $440
Complete internal kit w/ controller (C4343CDR-1) $495
External for parallel printer port (C4345A) $545
Sony 2x8
Internal IDE (CDU928S) $399
Kit w/ 1 disk, and software compatible with Win 95 & Win NT 3.51 & up. Req IDE controller. (CDU928SKIT) $429
Mitsumi 2x6
IDE Kit includes 3 disks, and software compatible with Win 95 & Win NT 3.51 and up. Requires IDE controller.
Internal (CRMC2600TE) $460

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1080MB	4200	Toshiba	MK1002MAV	$239
1400MB	4200	Toshiba	MK1401MAV	$269
2160MB	4200	Toshiba	MK2103MAV	$369
3080MB	4200	Toshiba	MK3303MAV	$629

SCA *Single Connector Attachment*

2150MB	7200	Seagate	ST32171WC	$619
4350MB	7200	Seagate	ST34371WC	$889
4550MB	10,000	Seagate	ST34501WC	$999
9100MB	7200	Seagate	ST19171WC	$1399
9100MB	10,000	Seagate	ST19101WC	$1699

FC-AL *Fibre Channel - Arbitrated Loop*

4550MB	7200	Seagate	ST34572FC	$Call
4550MB	10,000	Seagate	ST34501FC	$1059
9100MB	7200	Seagate	ST19171FC	$1569
9100MB	10,000	Seagate	ST19101FC	$1699

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7-14Gig	8mm, 60MB/min, EXB8700	$1069
(EXB8700 includes: 1 tape, 1 cleaning tape, and backup software)		
20-40Gig	8mm, 360MB/min, EXB8900	$4329
70-140Gig	8mm, 60MB/min, EXB10H	$4259

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2-4Gig	DAT-DC, 42MB/min, C1536AI	$619
4-8Gig	DDS-2 DAT, 60MB/min, C1599AI	$939
12-24Gig	DDS-3 DAT, 120MB/min, C1554AI	$1379
72-144GB	DDS-3 DAT, 120MB/min, C564BA	$2779

SEAGATE

2-4Gig	DAT-DC, 4BMB/min, C4324RP	$629
4Gig	Mini, 29MB/min, TST8000	$339
4-8Gig	DDS-2 DAT, 4BMB/min, C4326NP	$739
48-96Gig	DDS-2 DAT, 4BMB/min, C4586NP	$1849

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SONY

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4-8Gig	DDS-2 DAT, 90MB/min, SDT7000AI	$849
12-24Gig	DDS-3 DAT, 144MB/min, SDT9000AI	$1069
32-64Gig	DDS-2 DAT, 90MB/min, TSL7000X	$2159

QUANTUM

15-30Gig	DLT, 150MB/min, DLT2000XT	$2679
20-40Gig	DLT, 180MB/min, DLT4000	$4099
75-150Gig	DLT loader, 150MB/min, DLT2500XT	$4949
100-200Gig	DLT loader, 180MB/min, DLT4500	$6819
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1.2GB 512K	[TJ1.2]	$51	$47	$45
1.3GB 1024K	[TJ1.3]	$51	$47	$45
2.3GB 512K	[TJ2.3]	$69	$65	$63
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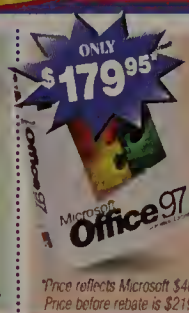

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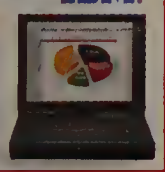

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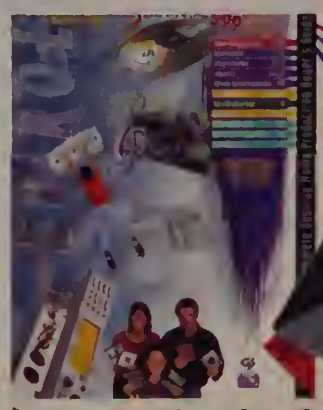

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Contura 420C,420CX,430C,430CX	4Meg-8Meg-16Meg-24Meg	45-75-165-235
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LTE 5000,5100,5200,5300	6Meg-16Meg-32Meg-64Meg Kit	95-145-255-495
LTE Elite 4140C,CX,4-75CX	4Meg-8Meg-16Meg-24Meg	45-75-165-235
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Ambra SN Series	4Meg16Meg	75-175
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AST Ascentia A Series	8Meg-18Meg-32Meg-64Meg	85-145-335-880
AST Ascentia 950	8Meg-16Meg	85-140
AST Ascentia P30, P50	8Meg-16Meg-32Meg	85-185-305
AST Ascentia J10, J30, J50	8Meg-16Meg-32Meg-40Meg	95-185-CALL-CALL
AST Ascentia 900N, 800N, 810, 910	8Meg-16Meg	95-185
AST Ascentia J10, J30, J50	8Meg-16Meg-32Meg-40Meg	95-185-CALL-CALL
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AST Power Exec 3-25, 425EL, 425SL	4Meg-16Meg	75-185
AST Power Exec 4-33SL	4Meg-16Meg	75-185
AT & T Globalyst 130, 200, 250	4Meg-8Meg-16Meg	65-95-145
Austin Edge	8Meg-16Meg	96-130
Austin Edge Duel	16Meg-32Meg	135-135
Austin Vista	4Meg-8Meg-16Meg-24Meg	55-85-135-199
Cannon Innovs Book 150, 175	4Meg-16Meg	65-165
Cannon Innovs Book 200LS	4Meg-8Meg-16Meg-20Meg	65-95-215-345
Cannon Innovs Ink Book 350CD, 360, 475	4Meg-16Meg	85-165
Cannon Innovs 486-10	4Meg-16Meg	75-215
CTX EZ Book 5x86 Pent Series	4Meg-8Meg-16Meg	CALL
DELL HiNote Ultra, Ultra II	4Meg-8Meg-16Meg	55-75-125
DELL HiNote VP 520, 525, 535	8Meg-16Meg-32Meg	95-145-275
DELL HiNote VP 5100, 5120	8Meg-16Meg-32Meg-64Meg	85-145-225-699
DELL HiNote	8Meg 16Meg-32Meg	65-95-135
DELL Lattitude LM (pairs)	4Meg-8Meg-16Meg	55-95-185
DELL Lattitude 433 C, Cx	4Meg-16Meg	75-195
DELL Lattitude LMP (pairs)	4Meg-8Meg-16Meg	75-115-195
DELLL Lattitude LX, M	4Meg-8Meg-16Meg	75-115-195
DELL Lattitude XP XPi	4Meg-8Meg-16Meg	75-115-195
Epson ActionNote 650, 650C, 660C, 660CX	4Meg-8Meg-16Meg	69-105-189
Epson ActionNote 700, 700C, 700CX	4Meg-16Meg	75-185
Epson ActionNote 880, 866C 890	4Meg-8Meg-16Meg-20Meg	55-85-155-195
Epson ActionNote 4LC-25, 4LC-33, 4SLC-2-50, 400	8Meg	85
Everex Tempo LX, LX20 Carrier	2Meg	85
Fujitsu Monte Carlo, Milan, Montego	6Meg-16Meg-32Meg	75-145-275
Gateway 2000 Colorbook 4-33	4Meg-16Meg	65-175
Gateway 2000 Nomad 425 OXL-SXL	4Meg-16Meg	155-755
Gateway 2000 486 Handbook or Liberty	4Meg-16Meg	55-165
Gateway 2000 Solo Series	4Meg-8Meg-16Meg	75-95-145
Gateway 2100 Solo Series	8Meg-16Meg-32Meg	CALL-CALL-CALL
Hitachi C-Series	8Meg-16Meg-32Meg	65-135-235
Hitachi E-Series	8Meg-16Meg-32Meg	85-145-275
Hitachi M-Series	8Meg-16Meg-32Meg	75-125-255
HP Omnibook 300, 480, 425	2Meg-4Meg	80-125
HP Omnibook 530, 600	4Meg-8Meg-16Meg	65-95-145
HP Omnibook 4000	4Meg-8Meg-16Meg	85-95-145
HP Omnibook 5000	8Meg-16Meg-32Meg	85-165-315
HP Omnibook 6000	4Meg-8Meg	85-110
Leading Edge Avva 2000	4Meg-16Meg	65-175
Laxmark SE10	4Meg-8Meg	75-115
Magnavox Metalite	4Meg	115
Micron Transport Pentium	8Meg-16Meg	115-165
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Midwest Micro Elite or Soundbook CD	4Meg-8Meg-16Meg	75-115-195
NCR Safari 3180, 3181	4Meg-8Meg	75-115
NEC Ultralite Versa E, V, MP	4Meg-8Meg-16Meg-20Meg	60-95-105-295
NEC Versa, S, Versa 2000 & 2000D 600	4Meg-8Meg-16Meg	85-125-185
NEC Versa 4000, 4050-4080	4Meg-8Meg-16Meg-32Meg	65-95-165-295
NEC Versa 6000, 6050	8Meg-16Meg-32Meg-64Meg	75-145-235-CALL
Olivetti Echos P75 P1335 (pairs)	4Meg-8Meg-16Meg	85-125-215
Packard Bell 386SX, 286	4Meg	85
Peckard Bell Statesman	2Meg-8Meg	45-95
Panesonic CF-V21P, CF-560	4Meg-16Meg	65-165
Panesonic CF-V41	4Meg-8Meg-16Meg-32Meg	75-115-215
Sager Midem, all models	4Meg-8Meg-16Meg-32Meg	75-99-175-399
Samsung Sens 810	8Meg-16Meg	CALL
Sanyo 17-18 NB	2Meg	85
Sceptre Sounds, all models	4Meg-8Meg-16Meg	55-95-155
Sharp 3030, 3040, 3070	8Meg-16Meg-32Meg	95-135-275
Sharp 6781, 6881, 6785, 8700, 6800, 6741	2Meg-4Meg	75-125
Sharp 8150, 6650, 6660, 7700, 7760	4Meg-16Meg	85-125
[illegible]	[illegible]	[illegible]
Sharp 3010 3020, 3050 3060	4Meg-8Meg-16Meg	65-105-185
Sharp 9000, 9030	8Meg-16Meg-32Meg	75-185-395
Sharp 9040, 9070 (pairs)	4Meg-8Meg-16Meg-32Meg	65-125-215-525
Sharp 9080 (pairs)	4Meg-8Meg-16Meg	55-85-135
Sharp Widenote 100T	8Meg-16Meg-32Meg	95-185-299
TI 4000, 4000E, 4000M	4Meg-16Meg	140-715
TI 5000, 5100, 5200, 5300	8Meg-16Meg	95-185
TI 6020, 6030	8Meg-16Meg-32Meg	215-395-CALL
TI Extensa, 450, 450T, 455 455T 570	4Meg-8Meg-16Meg	55-95-165
TI Extensa, 550, 555, 590, 580 (pairs)	4Meg-8Meg-16Meg	55-95-165
Twinhead, Altima, Compudyne, 486SX, DX, Tandy 4860	4Meg-8Meg-16Meg	85-145
Ultra 486 TS38	4Meg-8Meg-16Meg	75-95-175
Winbook FX 133	16Meg-32Meg	135-275
Winbook XP	16Meg-32Meg	135-265
Winbook XP5	32Meg	265

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1MB X 8-70NS SIMM	[illegible]	1MB X 9-100NS 9 CHIP SIMM	[illegible]	4X36-16MB-70NS/60NS MAJOR	105
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4MB X 8-70NS SIMM	[illegible]	1MB X 9-80NS 9 CHIP SIMM	[illegible]	8X36-32MB-60NS LOGIC	180
4MB X 8-60NS SIMM	[illegible]	1MB X 9-70NS 3 CHIP SIMM	[illegible]	8X36-32MB-70NS MAJOR	210
30 PIN 9 BIT SIPPS		1MB X 9-70NS 9 CHIP SIMM	[illegible]	8X36-32MB-60NS MAJOR	230
1MB X 9-100NS SIPP	[illegible]	1MB X 9-60NS 3 CHIP SIMM	[illegible]	16X36-64MB-70NS/60NS	210
1MB X 9-80NS SIPP	[illegible]	1MB X 9-60NS 9 CHIP SIMM	[illegible]	1 X 32-4MB-70NS/60NS	[illegible]
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Zenith Z-Note 425LN, LNC, LNP	4Meg	85
Zenith Z-Note MX	4Meg-8Meg-16Meg	65-95-175
Zenith Z-Star 4-33	2Meg-8Meg	45-95
Zenith Z-Star Ex	4Meg-8Meg-16Meg	55-105-165

TOSHIBA NOTEBOOK MEMORY

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Tecra 500-P850	8Meg-16Meg-32Meg	80-160-295
Tecra 700 (SDRAM)	8Meg-16Meg-32Meg	80-160-295
Tecra 710, 720	8Meg-16Meg-32Meg	80-160-295
Tecra 730 COT, 730X COT	8Meg-16Meg-32Meg-64Meg	85-135-235-855-1699
T2000SXSX,T2200SX-T1800, 1850, C	8Meg	80
T2100, 2105, 2155, 2110, 2115	4Meg-8Meg-18Meg-24Meg	60-80-160-295
T4500, C, T4600 T4700,T1900, T1910, T1950 (3.3v)	4Meg	60
T4500, C, T4600, T4700,T1900, T1910, T1950 (3.3v)	8Meg	80
T4500, C, T4600, T4700,T1900, T1910, T1950 (3.3v)	18Meg-32Meg	160-295
T3400CT, T2400, T3600	4Meg-8Meg-16Meg-24Meg	60-80-180-245
T100, 105, 110, 115	8Meg-16Meg-32Meg	80-160-295
T400, 405, 410, 415, 420, 425	8Meg-16Meg-32Meg	80-160-295
T400CS, 400CDT, T100, 105EDO	8Meg-16Meg-32Meg	80-160-295
T600, 810, CT EOD	8Meg-16Meg-32Meg	80-160-295

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Cannon LBP 430	—	—	35	—	—	45	—	—	—	—	—
Cannon LBP 860, 1260	—	—	—	35	—	59	—	90	140	305	—
Cannon LBP4, 4Lite, 4plus	—	—	125	175	—	—	—	—	—	—	—
Epson 6000, Action Laser	—	—	—	125	—	225	—	—	—	—	—
Epson Action Laser 1100,1600	—	—	85	70	—	95	—	195	355	—	—
Epson Action Laser II	—	—	70	—	170	—	270	—	—	—	—
Epson 8000,1800, 4000, 4100, 4300	—	—	85	—	170	—	270	—	—	—	—
Epson 1000, 1500, 5000, 5200	—	—	—	65	—	175	—	—	—	—	—
HP 2, 2D	—	—	—	65	—	95	—	—	—	—	—
HP3, 3D, 3P, 2P, 2P+	—	—	—	65	—	95	—	—	—	—	—
HP 4, 4M 4Si, 4SIMX	—	—	—	45	—	55	—	—	—	—	—
HP 4P, 4PLUS, 4MPM 1600, 1600CM	—	15	25	—	—	45	—	—	85	—	—
HP4L	—	30	—	—	—	—	—	—	—	—	—
HP 3SI	—	35	—	—	—	65	—	—	95	—	—
HP 5L	—	25	70	—	—	85	—	—	195	—	—
HP 5P, 5MP, 4V, 4MV, 6P, 6MP	—	—	15	35	—	45	—	—	85	120	—
HP Design Jet 600, 650, 200	—	—	—	35	—	45	—	—	85	135	235
HP Deskjet 500,500C,510,550,560	—	30	—	—	—	—	—	—	—	—	—
HP Daskjet 1200C, 1200C-P	—	—	—	35	—	45	—	—	85	—	—
HP Paintjet XL,300	50	—	—	—	—	85	—	—	140	295	—
IBM Laser 4019 4019E	—	—	—	—	135	—	—	—	—	—	—
IBM Laser 4029 4037	—	—	—	—	—	85	—	—	—	—	—
IBM Laser 4039 4078	—	—	—	65	—	85	—	—	350	—	—
Konica L,P-3110, 3115	—	—	115	165	235	—	—	—	350	—	—
Lexmark Media 4C, 4X, 4SX	—	—	Call	Call	Call	—	—	—	—	—	—
Lexmark Optra L, LX, R, RX	—	—	—	—	—	55	—	—	90	135	255
Lexmark Valuwriter 300, 800	—	—	25	35	—	85	—	—	—	—	—
Lexmark Valuwriter 200, 400, 600	—	—	25	35	—	85	—	—	—	—	—
NEC 90, 290	—	—	—	85	—	—	—	—	—	—	—
NEC 95, 97	—	—	—	75	—	—	—	—	—	—	—
NEC Silentwriter 95, 95fx, 97, 97fx	—	—	—	70	—	—	—	—	—	—	—
Oki 400	—	—	—	75	—	—	—	—	—	—	—
Oki 400E, 400EX, 410E 410EX	—	—	85	105	165	—	185	—	—	—	—
Oki 610E, EX, 600E, EX, 610E, EX	—	—	25	35	—	—	75	—	115	175	—
Oki 830, 840	—	—	—	85	—	—	—	—	—	—	—
Oki 2350, 2450	—	—	Call	Call	—	—	—	—	—	—	—
Packard Bell PB 9500	—	—	—	135	—	225	—	—	—	—	—
Peckard Bell 9815	—	—	—	135	—	225	—	—	—	—	—
Panasonic 4420, 4450I	—	—	—	95	—	165	—	—	—	—	—
Panasonic 4410, 4430	—	—	—	65	—	125	—	—	—	—	—
Panesonic 4450	—	—	85	—	—	—	—	—	—	—	—
Panasonic 4400, 5400	—	—	85	95	—	185	—	—	—	—	—
Panasonic 4440, 5410, 6500	—	—	75	95	—	155	—	—	—	—	—
Sharp 9400, 9460, 9600 9700E	—	—	65	95	—	145	—	—	—	—	—
Sharp 9500, E, H, 9700, H	—	—	75	—	—	255	—	—	—	—	—
TI XL,PS17-PS35	—	—	45	—	—	—	—	—	—	—	—
TI Microleser Pro E, Powerpro 600	—	—	65	125	—	185	—	—	325	—	—
TI Microwriter	—	—	75	115	—	—	—	—	—	—	—

NOTEBOOK BATTERIES

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ABC N8485SLC/25	110
Acer AcerNote 350, 350C	110
Acer AcerNote 730, 760 & 760 series	190
Acer AcerNote 730, 760 & 760 series	138
Acer AcerNote 750 series	158
Acer AcerNote 750 series	178
Acer AcerNote Lite	178
Acer Anywhere 386	158
Acer Anywhere 1100LX 386SX, 1120NB	138
Acer K 386S Notebook	170
Acer 386SX/25NB	170
Acrobat 386SX/25	75
Acros 325SE	170
Alji Travel Pro	90
Altur 386SX NB	90
ALR NB	214
ALR Venture	150
Altech 386SX/20	130
Altech NB	170
Altez 3300SX	130
Altima 325SL, 486SLC, 420, 433D	150
Altima 486DX/33	188
Altima LSX, LSX 386SX/20	130
Altima NSX, 386SX/16 NB	130
Alton NB	99
Amax EZ Lite 16	98
Ambra SN435, SN433C, SN8660C	150
Ambra SN425, SN433C, SN8660C	95
Ambra NC425, NC425SL	190
Ambra NC425, NC425SL	138
American Megatron	99
AMS 5300NB	190
AMS 350C	199
AMS SoundPro P54	190
Amrel 486DX/33, 486SLC	95
Amrel 486SX/25, MLT386SXE	99
Amstrad AN8386SX	105
Apple Duo 200-270+, 2300 series	138
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Arche Tech NP-101 NP-102 388NB	116
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Arima ATC286/40, ATC 386SX	142
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ARM Patriot, TS30M, TS30P	178
ASE Euphoria	178
AST A Series	178
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AST Advantage Explorer 486SX/25	178
AST Advantage Explorer 486DX4/100	178
AST Advantage Explorer 486SX/33	150
AST Ascenta 700N	81-76
AST Ascentia 800, 810N	159
AST Ascentia 900N	199
AST Ascentia 910N, 950N	269
AST Bravo NB	178
AST PowerExec series	199
AST PremiumExec Series	105
AT & T Globalist 130	178
AT & T Globalist 250	188
AT & T Safari NX20, 3170	158
AT & T Safari 3180, 3181, 3182	188
Attache BV-386	90
Aurora NB	110
Austin 386SX NB	98
Austin 486DX2/66	190
Austin NB	158
Avec TS35-25, 486SX/25 NB	90
Avec TS35-25, 486SX/25 NB	150

BCC Avanti SL386 ,235C, 425C,	190
BCC Avanti 425M, 486STN	190
BCC Avanti SL386 ,325C, 425,	150
BCC Avanti 425M, 486STN	150
Blackship 386SX/20	99
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Bona 3800SX	105
Bona 386SX, 3300SX/20	130
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Bondwell 386NB 486NC	90
Bondwell 486NC	98
Bondwell 486NC (old)	116
Bondwell 8200/8210/831010+/	116
Bondwell 8310A, Pro 81	98
Bondwell 8310V, B-310SX	110
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Chaplet NBC	105
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Compaq Contura Aero series	159
Compaq Contura 3/20, 3/25, 4/25, series	124
Compaq Contura 3/20 3/25, 4/25 series	124
Compaq Contura 400, 410	159
Compaq Contura 420 & 430 series	159
Compaq Elite	226
Compaq Lite series	191
Compaq LTE, LTE/286	104
Compaq LTE 386S/20	208
Compaq LTE 5000, 5100, 5200	192
Compaq Presano	262
Compaq Presano	389
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Compaq 286	170
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DEC 325P, Color NB	178
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DEC 325	198
DEC 450MC	158
DEC HiNote CS433L	178
DEC HiNote CS450 CS475	214
DEC PC 325SI 325SI/C, 425SL, 425SI/C	191
Dell 316LT	138
Dell 320 SLI	130
Dell 320 SLI	90
Dell 320N+, 325NC, 325NL	190
Dell 320N, 320N, 325NC, 325NL	150
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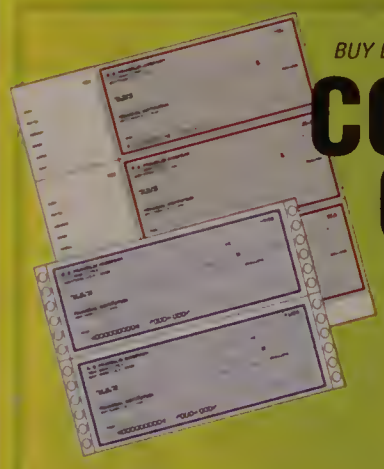

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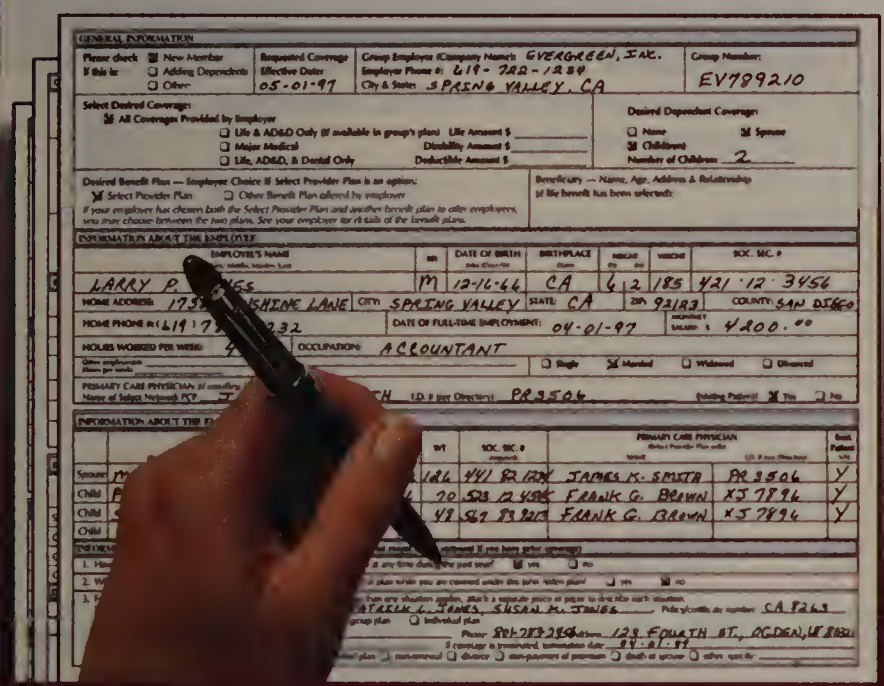

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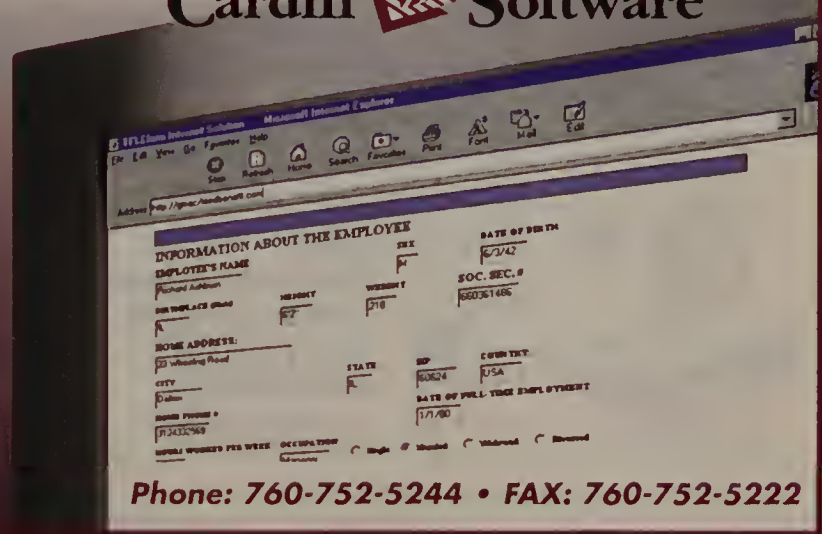

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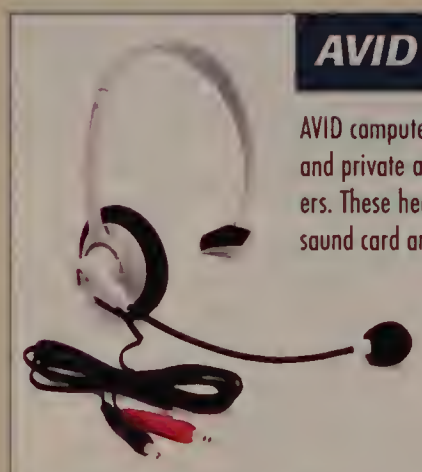

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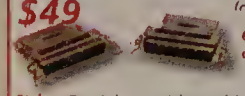

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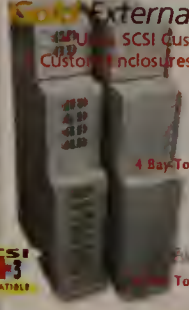

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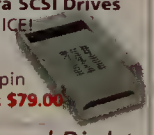

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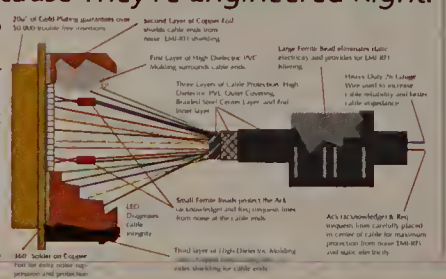

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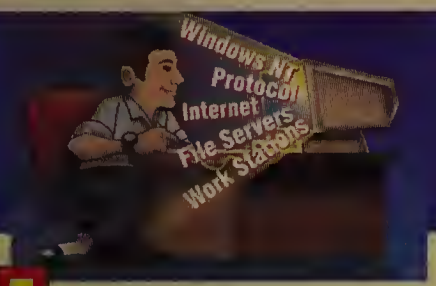

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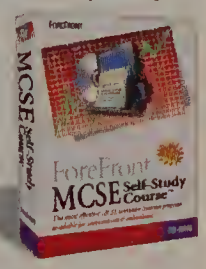

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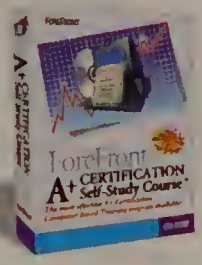

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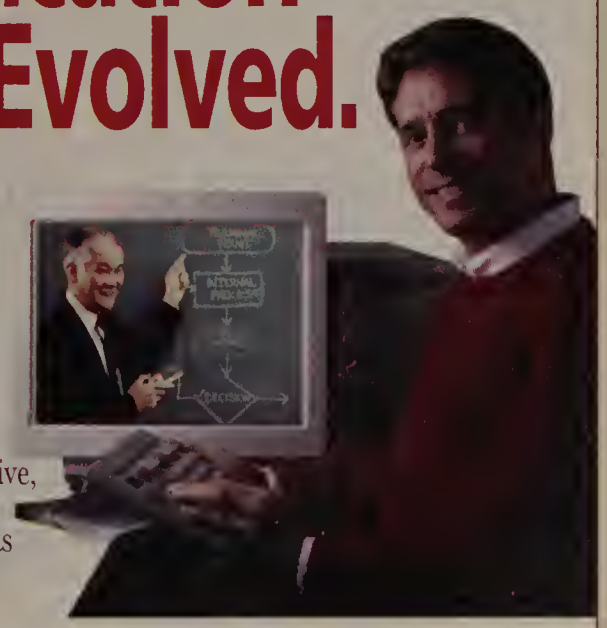

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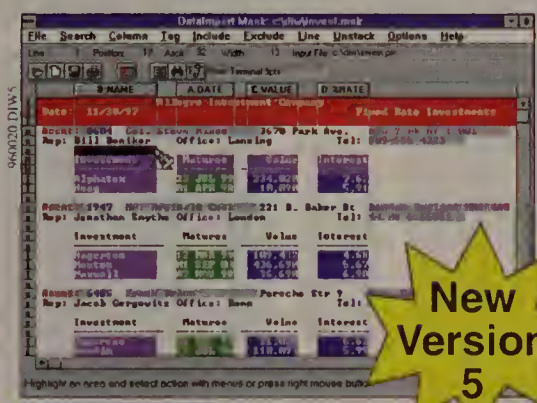

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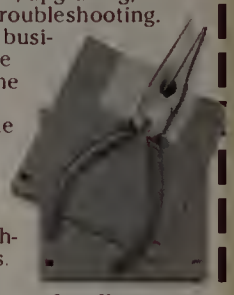

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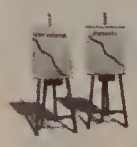

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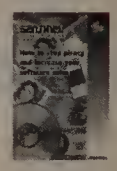

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952 Notebook computers
953 Windows 95 software
954 Monitors and video boards
955 Accounting software
956 Graphics software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
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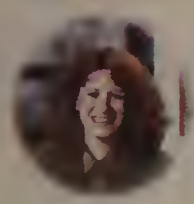

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When Push Comes to Shovel

BLATHER ABOUT PUSH IS the latest Internet frenzy. The buzzword has come to mean several very different things, but it usually refers to data that's "pushed" to you automatically, as opposed to data you "pull" from the Web when you want it. Since that data can include news, stock quotes, mailing lists, software updates, and generous helpings of spam, you can bet push isn't all it's cracked up to be.

It's also not exactly a new concept. This magazine's a good example: It pushes plenty of information at you—some you wanted, some you didn't know you wanted until you read it, and some you couldn't care less about—plus lots of advertising of greater or lesser interest. PointCast, generally recognized as a pioneer of Internet push, does something similar by displaying information and ads in the guise of a screen saver. So would you rather get *PC World* in your physical mailbox every month or have it (or a specially customized version) delivered to your electronic in-box?

That's not merely a rhetorical question. The future of print media may well depend on the success or failure of the push metaphor. But the world is hardly short on ways to deliver information, so the question is whether push can do a better job than traditional models. There's undoubtedly a market for time-critical items delivered in timely fashion, but once you get beyond stock quotes, breaking news, traffic reports, and tornado warnings, there are few things most of us absolutely must know this very minute.

The world is hardly short on ways to deliver information. Can push do a better job than traditional media?

AGENTS: INTELLIGENT?

MANY PUSH SCHEMES assume the existence of so-called intelligent agents that magically deliver just the information you need. Maybe someday such wizardry will be possible, but for now customization is essentially limited to brute-force text-string searches, or to collaborative filtering, which matches your likes to those of other people. And as anyone who's used a search engine knows, striking a balance between too much information and not enough is a delicate task that computers are not particularly good at. Your choice: Wade through a flood of irrelevant garbage, or miss information you really want.

Push is also promoted as a way to deliver software, including fixes and upgrades. The idea sounds attractive to those of us whose hardware always seems to be two drivers behind the curve. But it could easily worsen the problem of companies blithely shipping software that doesn't quite work, with the intention of sending out fixes later. And if an upgrade suddenly exhibits bizarre behavior on your machine, there'd better be some way to restore things to the way they were before you installed it.

The nature of the network connection is crucial to push. If your PC is always wired to the Net, push can deliver time-critical information now and assemble less-urgent data in the background. If you dial in intermittently, those options become less feasible. Until we all get high-speed 24-hour digital hookups, one stopgap may be data broadcasting, a scheme that Microsoft and satellite broadcasters like DirecTV are working on. Leave your machine on all night, and your hard disk might have the entire newspaper ready for you to read over breakfast. Nice, but you could just as easily leave the machine off, grab the paper off the porch, and listen to the latest headlines on radio or TV.

SURF 'N' TURF

CLAIMS ABOUT PUSH'S potential are often based on dubious assumptions. Push pushers often pretend bandwidth is free, which it isn't. Replacing bandwidth with data broadcasts assumes mass storage is free, which isn't true either. And virtually no one will discuss what happens if today's all-you-can-eat Internet pricing goes away.

Besides, push has lots of competition from traditional media, which are not about to let their turf go undefended. In the end, one of the Net's greatest advantages may be its vast searchability: Unlike other media, it's a great place to find specific information when you need it. In other words, the Net's got pull.

PC World *contributing editor Stephen Manes is a columnist for the* New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster, 1994, 800/223-2348).* ■

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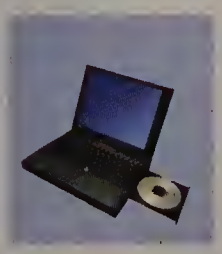

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